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Official Organ of The Massachusetts Medical Society
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OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Volume 206 Number 3 — Domestic $6 per Annum, 25c per Copy; Canada $7.04, Foreign $7.56 — JANUARY 14, 1932 — Published Weekly in Boston at 8 The Fenway

CONTENTS

NEW ENGLAND SURGICAL SOCIETY

Operative Procedures in Common and Hepatic Duct Injuries. *Howard M. Clute* 47
Endometriosis. *Halbert G. Stetson* and *John E. Moran* 52

Paraplegia Associated with Non-Tuberculous Kyphoscoliosis; A Case Report and a Survey of the Literature. *Henry R. Viets* and *Milton Henry Clifford* 55
Intravenous Pyelography During Pregnancy. *George C. Prather; E. Granville Crabtree,* and *Samuel A. Robins* 62
The Development of the Rest Treatment in Pulmonary Tuberculosis. *Joseph H. Pratt* 64
The Art and Human Nature. *Stewart R. Roberts* 70

MEDICAL PROGRESS

Progress in Obstetrics. *John Rock* 77

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Case 18021—A Case of Palatal Paralysis. *Maurice Fremont-Smith, Richard C. Cabot* and *Tracy B. Mallory.* Case 18022—Abdominal Pain, Constipation and Vomiting without Localizing Signs. *Gray H. Twombley, Tracy B. Mallory, Oliver Cope, James C. White, Chester M. Jones* and *Donald S. King* 88

EDITORIALS

"K Medium" 92
Suggested Community Studies 92
This Week's Issue 93

(*Contents continued on next page*)

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CONTENTS

(Continued)

MASSACHUSETTS LEGISLATIVE NOTES 94

BOOK REVIEWS

Eye, Ear, Nose and Throat for Nurses. Jay G. Roberts 102
Medical Electricity for Students. A. R. I. Browne 102

MISCELLANY

The Alleged Discovery of the Germ Which Causes Anterior Poliomyelitis 94
The Appointment of Dr. Bretler 94
The Appointment of Dr. Jacob Kasanin 94
Cancer Relief Fund 54
Columbia Raises Medical Standards 54
Conquering Diphtheria 76
The Cost and Effect of Mental Ailments 54
Items of Historical Interest Relative to Pellagra in the United States 87
Mortality Rates 76
Pure Vitamin D 54
The Widespread Incidence of Smallpox 87

NOTICES 94

REPORTS AND NOTICES OF MEETINGS 96

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES 101

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The New England
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VOLUME 206 JANUARY 14, 1932 NUMBER 2

NEW ENGLAND SURGICAL SOCIETY

OPERATIVE PROCEDURES IN COMMON AND HEPATIC DUCT INJURIES*

BY HOWARD M. CLUTE, M.D.†

TRAUMATIC obstructions of the common bile duct present problems for treatment which are most serious and which in a great majority of cases are by no means either adequately or satisfactorily handled. It is my purpose in this paper to review the causes of traumatic obstruction of the common duct in the twenty-five cases which have been treated in the Lahey Clinic, to discuss the various operative procedures which we have used in these cases and to report the results of these measures.

In all obstructions of the common duct the first problem which the patient presents is the altered physiology accompanying the lesion. The utmost care must be exercised in the management of possible liver failure, kidney insufficiency and alterations in the coagulation ability of the blood, before any mechanical measures can be undertaken to correct the common duct obstruction. It is not my desire at this time, however, to discuss at all the management of the patient with obstructive jaundice before or after the operative procedure and it is assumed in this paper that this necessary treatment is undertaken in all operative cases.

The methods of productions of common duct strictures are well recognized. I. A suppurative cholangitis may occur as a result of which there is a sufficient loss of epithelial tissue over some area of the biliary tract to produce a stricture as the process heals and fibrous tissue is deposited. This we must consider as a very rare cause. It has not occurred in our experience. II. Ulceration and stricture formation may occur about a stone which is wedged in a large bile duct. In certain cases a fistula may form from the ulceration of the stone into the stomach or adjacent intestine or the stone may remain for a long period in the common duct with resulting fibrous tissue contraction at the point of ulceration. This also is quite rare but it probably accounts for four cases in our experience. III. Crushing injuries or severe blows may result in a rupture of the common duct or one of the hepatic ducts and with the healing of the ruptured area stricture formation occurs. This was present in one of our cases. IV. The most common cause of traumatic obstruction of the common duct is an injury of the duct at the time of some operative procedure upon the gall bladder or the biliary tract. In the twenty-five cases which we are studying, this was the cause of the stricture in twenty cases.

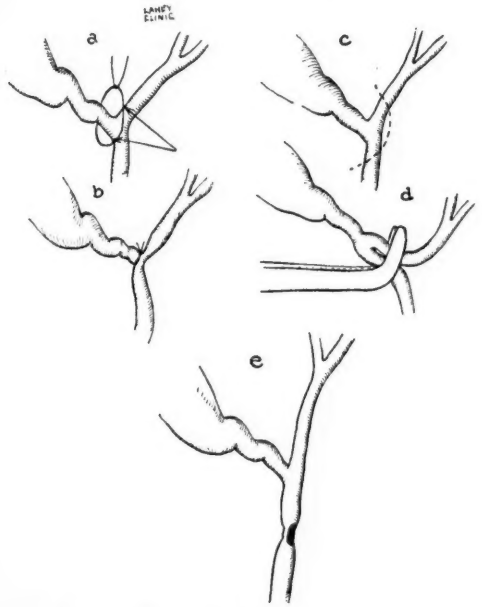

FIGURE I. Common methods of production of strictures of the common and hepatic duct.

"A"—Ligature placed too low upon the cystic duct so that when tied it produces a marked narrowing of the common duct, as shown in "B".

"C"—Traction upon the gall bladder pulls up the common and common hepatic duct so that they are clamped and cut under the impression that the cystic duct alone is being tied, as in "D".

"E"—Stricture of the common duct may follow ulceration around a stone long present in the common duct.

Since such an overwhelming proportion of traumatic obstructions of the common duct are the result of injury of the duct at cholecystectomy, it is desirable to review once again the common causes of this accident. One of the easiest ways in which the common duct may be injured during cholecystectomy is by placing a ligature upon the cystic duct at too low a level so that part of the common duct is puckered up by the ligature. To obviate this possibility we

*The Lahey Clinic, Boston, Mass.
Read at the annual meeting of the New England Surgical Society, at Scarboro, Maine, September 12, 1931.

†Clute—Surgeon, Lahey Clinic. For record and address of author see "This Week's Issue," page 93.

always relax the cystic duct in the clamp so that we may see precisely where the tie will be placed and can therefore be certain that none of the common duct will be included by the cystic duct tie. The second frequent cause for injury of the common duct in cholecystectomy is the careless clamping of the duct in a hurried attempt to control hemorrhage from the cystic artery. In other patients a clamp has been placed on the cystic duct and tied off without clear vision of the common duct, and unfortunately the clamp has included part of the common duct. The third way in which the common duct is injured is by making such heavy traction on the gall bladder that the doubled-up common duct is mistaken for the cystic duct. By this method a definite segment of common duct is actually removed at the time of the operation.

It is common surgical knowledge that in any operation the first consideration is adequate exposure of the field, and yet in view of the number of cases of common duct injury that we see following cholecystectomy it is at once obvious that in gall bladder surgery this axiom is not always appreciated. It will be apparent from the results of the operative treatment of common duct strictures which we shall report to you that there are no pains too great to be undertaken in the exposure and recognition of the cystic duct, the common duct and common hepatic duct at the time of cholecystectomy. Failure to visualize these structures and lack of certainty as to the exact location of clamps and ties during cholecystectomy may result in an accident to the common duct with resulting complications of a most serious or even fatal character. We wish to emphasize most strongly that in those cases in which adequate exposure of the common and cystic ducts cannot be obtained, either because of technical difficulties or because of lack of skill on the part of the operator, the procedure of choice is cholecystostomy rather than cholecystectomy. There is no comparison between a patient with a gall bladder which has only been drained and a patient with a common duct which has been injured during the course of a difficult removal of the gall bladder.

There are five operative procedures which may be applied in traumatic strictures of the common bile ducts. These are: I. Plastic repair of the duct. II. An end to end suture of the common duct. III. The anastomosis of the gall bladder to the stomach or intestine. IV. The anastomosis of the common duct or the common hepatic duct directly into the duodenum or stomach. V. The establishment of a complete external biliary fistula and its later transplantation into the intestinal canal.

Plastic operations on the common duct or the common hepatic duct, in our experience, have given the best percentage of good results over a period of years. It is, of course, true that those patients in whom a plastic operation can be done are the patients in whom the injury to the common duct has been relatively slight. If there is no extensive loss of common duct tissue the chance of repair of the strictured area is thereby much increased, and in comparing the results of plastic operations with other procedures it must be appreciated that these operations are done on the cases of the milder type of lesion.

The actual procedure which has been employed has varied but little. When a long narrow strictured portion of the duct was found which could be incised longitudinally and sutured transversely after the manner of the Mikulicz plastic operation on the pylorus, this procedure has been followed. If it is possible to drain this strictured area after the plastic operation by a T tube which is inserted either above or below the point of suture rather than through the point of suture, as suggested by Judd, we believe this is a distinct advantage. In any case the common duct in such a plastic repair should be drained by a tube for a period of weeks or, in extensive strictures, for a period of many months. In certain patients in the group an adequately lined epithelial tube was not present and the strictured area was therefore incised longitudinally and the fibrous tissue brought around over the T tube which was placed in the stricture. In these cases the results have not been so satisfactory, and trouble has later arisen, either serious or mild in character.

Eleven of this group of patients have had plastic operations on the common or common hepatic duct for traumatic strictures. Five of these cases are well, three, six, seven, eight and nine years after their operation. Three of the cases have gone one year or less and then have had slight trouble, but not sufficient to require further operation. Two of the cases were well less than a year after the plastic procedure and then further operation was necessary. One case has just been done within a few weeks and cannot now be reported upon. It is apparent, then, that when stricture of the common duct does not involve the entire circumference of the duct and when a satisfactory plastic procedure can be performed upon it an excellent result may be anticipated in a majority of cases. We believe that prolonged drainage of the duct after this procedure is desirable, however, and adds materially to the chance of ultimate recovery since it reduces to a minimum the remaining infection which may have been present. It is unfortunate that there is no means by which the strictured area in the common duct may be dilated simply and adequately as can stricture of the male urethra after incision. Were it possible to devise some means for the periodic dilation of the common duct,

many more cases could be subjected to plastic repair than is now possible and more permanent results could be obtained.

The second operative procedure which we have employed in injuries of the common duct has been a direct anastomosis of the common duct end to end, over a T tube drain. The opportunity to perform this end to end suture most commonly arises in cases in which a definite segment of the common duct has been removed at the time of the previous cholecystectomy. If the distance between the common hepatic duct and the cut end of the common duct is not more than half or three-quarters of an inch it is possible by slight mobilization of the duodenum to bring the two ends in close apposition and so make a satisfactory suture. Cases have been reported in which a strictured area of the common duct was completely excised and the ends of the duct sutured. Similarly tumors of the common duct have been removed and the two ends of the duct sutured. In general, however, this procedure is a dangerous one since the possibility of stricture formation at the point of union is a most distinct one. If good mucous membrane is present on each of the two ends of the divided duct, union without stricture formation may occur, but if the ends of the ducts are frayed and filled with fibrous tissue and inflammatory products or if the sutures are under great tension satisfactory union probably will not occur. It is probably true that in those patients in whom sufficient of the common hepatic duct remains, a direct anastomosis of this common hepatic duct into the duodenum would be preferable to an end to end suture.

We have made an end to end suture of the common duct in three cases. In two of these, obstructive jaundice occurred within less than three months after operation and further operation became necessary. In one case where a most satisfactory suture of the duct was possible a perfect result has now been present for over eight months.

The third technical procedure, an anastomosis of the injured common duct directly into the duodenum or stomach, is an operation which has been reported by Dr. Charles Mayo and other surgeons and has given many very satisfactory results. It is an operation technically difficult, the success of which is threatened by the possible occurrence of a duodenal fistula or of bile leakage. Nevertheless when a good proximal segment of the common duct or the common hepatic duct is present and the duodenum can be mobilized adequately to bring it up to this duct we would be in favor of its use. We have not thus far attempted this procedure in our own practice but we are anticipating its adoption in every case in which it can be done in preference to attempts to establish external biliary fistulae.

The fourth operative procedure for the management of common duct strictures is cholecystgastrostomy. When the injury to the common duct is below the cystic duct and the gall bladder is still in place, anastomosis of the gall bladder to the stomach can readily be done. We feel that, as an added measure of safety for this operation, a small T tube drain of the common duct should be inserted and left in place for two weeks after the anastomosis. This will relieve the common duct obstruction immediately after the operation and if it should be the case that the cystic duct was not patent and bile failed to drain through the cystic duct and gall bladder into the stomach, the patient's jaundice could be overcome while preparations were being made for some further operative procedure.

We have had but one patient in whom it was possible to perform a cholecystgastrostomy for stricture of the common duct. She was operated upon above five months ago and to date has made a most satisfactory convalescence.

The fifth operative procedure which we have used in traumatic obstructions of the common duct has been the transplantation of an external biliary fistula into the stomach or duodenum. This procedure is, of course, a two-stage operation and possibilities of failure are present in each of the two stages.

In considering first the establishment of a complete external biliary fistula, it has been our experience that attempts to make all of the bile drain to the surface of the abdomen through a fistulous opening are very frequently accompanied by failure. One of the commonest occurrences complicating attempts at external drainage of the common duct is the formation of an internal biliary fistula. These have been recently discussed by Dr. Lahey. These internal fistulae most commonly communicate with the duodenum and they are associated with infection about the point of drainage of the common duct with resulting ulceration of the duodenal wall and fistula formation. Prevention of the formation of internal biliary fistulae while an external fistula is being established is one of the fundamental concerns in this operation, and as yet we have found no means by which this prevention may be completely positive. It was felt by Dr. Lahey that the insertion of omentum between the injured common duct and the duodenum would prevent such fistula formation. This will undoubtedly assist but we find that it cannot be relied upon in every case.

We have performed twelve operations upon nine patients with common duct strictures for the purpose of establishing a complete external biliary fistula. Of these twelve operations only three good fistulae resulted. It is of course true that many of these patients were hopeless cases at the time of our operation. There had been two and sometimes three or four previous operations to reëstablish the common duct so that the first requisite for the establishment of an external fistula, the discovery of the common duct, was not always possible. In six of the failures,

however, we were able to discover the common duct and drain it adequately and yet we were unable to maintain external biliary drainage and establish a permanent external biliary fistula. In those cases which failed, the external drainage through the catheter sewed in the duct would be adequate for a period of weeks and then would gradually become less in amount. The stools would soon become colored with bile and it would be apparent that an internal biliary fistula had formed and was carrying most of the bile drainage through that channel. Two of the patients in this group of ten died within a few days of their operation as a result of their obstructive jaundice and operative shock and should perhaps not be considered as failures for the method under discussion. It is apparent, however, that in the patients who no longer present any recognizable common ducts which can be subjected to any plastic procedure or any anastomotic method the outlook is extremely serious. There is left at our command nothing save the hope of establishing an external biliary fistula, and as the above figures show, only about one-fourth of the operations will result in the establishment of a satisfactory fistula.

Transplantation of the complete external biliary fistula into the stomach or the duodenum can be attempted some three months or more after the fistula is established. This interval of drainage gives sufficient time for the wall of the fistula to be well formed and to develop a good blood supply. Success of the operation is threatened by the possibility of an external duodenal or gastric fistula and also by the failure of the biliary fistula to maintain complete drainage of the common duct. Convalescence from the procedure when it is successful may be marked, furthermore, by periods of chills, fever and jaundice related possibly to an ascending infection from the stomach to the biliary tract or possibly to periods of contracture of the fistula. On the other hand when the external fistula can be satisfactorily transplanted and the results are good it is a life saving procedure for patients who, in our experience, would otherwise be doomed to a fatal ending.

We have transplanted external biliary fistulae into the stomach or duodenum seven times. In three of the cases the external fistula was present when the patients first came to us and in the remaining four cases had been established as the result of our previous drainage of the common duct to the surface of the abdomen. Of these seven transplantations one case has been well for eight years, one for nine years and one has been well, save for occasional attacks of jaundice and fever, for one and a half years. Four of the operations have been complete failures, patients having developed either further external fistulae or having become again obstructed and jaundiced after a period of partial relief from their troubles.

This summary of the results of the operations for the establishment of an external biliary fistula and for the transplantation of the external fistula shows what a serious problem patients with common duct injuries, not readily treated by conservative operations, present. Of eleven cases of common duct injury who finally reached the stage in their operative procedures in which attempts at making and transplanting biliary fistulae were necessary, only three of the eleven had good results. The rest are now either jaundiced and suffering from chronic obstruction of the common duct, or are dead. Certainly we are convinced from this experience that any procedure which we may be able to perform, such as end to end anastomosis, plastic repair of the strictured area or transplantation of the common hepatic duct directly into the duodenum is to be desired and attempted before efforts are made for the establishment of an external fistula. The operation of transplanting an external biliary fistula must be reserved for the hopeless case in which it is no longer possible to find an adequate amount of common duct to transplant into the duodenum or to correct by a plastic repair. In these hopeless cases which are so discouraging an occasional success will be obtained by this method.

It is apparent from this summary of the results in our twenty-five cases of common duct strictures that this is a most serious lesion and that our emphasis of the necessity of avoiding injury to the common duct during the operation of cholecystectomy is not unwarranted.

The operations which we have described and which we have used in the repair of these lesions increase gradually in their severity and their technical difficulties as the lesion is increasingly serious in its nature and the good results to be expected diminish proportionately as the operative difficulties grow.

The smaller strictures of the common duct in which most of the duct is still present yield readily to plastic procedures. The larger strictured areas in which the ducts can still be found may yield to anastomoses of the two ends of the duct, or even better to a direct implantation of the common hepatic duct into the duodenum. In patients in whom the common duct has been utterly destroyed or greatly traumatized the last resort at present at our command is the establishment of an external biliary fistula for later transplantation into the duodenum. This operation is in the nature of a last stand against hopeless odds. Occasionally, however, it will result in a most satisfactory improvement and is therefore worthy of trial when no other method can be used.

Discussion

Dr. E. L. Hunt, Worcester, Mass.: I have had no personal experience with this particular phase of the accidents of surgery, but I was

impressed at the technique employed by Dr. McArthur, in Chicago, for meeting these conditions. He had operated on a prominent citizen of his town and the patient, after cholecystectomy, developed a complete jaundice. He met that situation by reopening and found that a section of the duct had been removed and he picked up the distal end and inserted a catheter down that end, way down so that it went into the duodenum. The funnel end of the catheter was inserted in the proximal end of the duct and the duct secured around that by a tie, and a strong silk ligature was put around the catheter in the space between the two ends. That was brought out and fastened to the skin. The hiatus between the two cut ends was thus bridged by the catheter.

In the course of time that repair became complete, practically, and, as I recall it, he allowed about six weeks, and then cut the string and let the catheter go on down the duodenum.

He had his pictures of the catheters in place and he demonstrated his patient, a complete success. The method takes advantage of the natural tendency of tubular structures to reëstablish themselves, quite similar to the way the fallopian tube, if it be tied off by an absorbable ligature, will promptly reëstablish its lumen.

I should like to ask Dr. Clute if he has had any experience with that technique, or knows of the experience of others. It is so simple that if it is effective and safe, it might get one out of an embarrassing situation now and then.

Dr. R. H. Miller, Boston, Mass.: I can't resist saying a word because I am so intensely interested. I wanted to hear this paper more than any other because it interested me so much and I wish first of all to congratulate Dr. Clute.

I have been practicing surgery for twenty years and, being connected with a large hospital, I have naturally done a good many operations and for the first fifteen or sixteen years I thought gallbladder surgery was very simple, and now I have seen enough common duct injuries so that I am very much impressed by the great importance of careful guarding against injury to the common duct.

It is perfectly criminal to clamp off the cystic duct blindly, as is done by so many people who are not sufficiently thoughtful of what they are doing. I have in the hospital today (this is just a matter of chance) three cases of common duct injury that I have operated on. Fortunately, I didn't do the preliminary operation in any instance. I say I have three—I hope I have three. I know I did one out of town just a few days ago and I don't know whether he has survived. I think he has.

All of those cases were practically moribund when they came to me and in each instance the first operation that I did—the only thing I could do—was to drain the common duct and relieve them of their intense cholemia.

If I, not having a very large practice, can see three cases of common duct injuries at one time, I assure you it is something that is of the gravest importance and every one of us must be particularly careful, in putting the clamp on the cystic duct, as that is where the injuries occur, although McVicker told me, at the Mayo Clinic, that they have had one or two instances of common duct stricture, following simple drainage of the gallbladder.

If we have an external biliary fistula and are going to operate on it to repair it, I believe very strongly in making the patient take his own bile for quite a long time previous to operation and he will be in that way in a much better condition; if we cannot fool them into drinking it, we use a small duodenal tube two or three times a day and make them take the bile in that fashion.

Some of our nurses are pretty adept in mixing fancy drinks. One patient drank her own bile without any trouble thinking it was a solution of strychnine, until one day the nurse happened to let a hint about it drop and the patient couldn't touch it after that. The patient was drinking her own bile without any trouble, but it used to make the nurse sick.

Dr. Peirce H. Leavitt, Brockton, Mass.: We had a case about eight years ago in which, during the operation, the common duct was inadvertently or carelessly cut and approximately half an inch of it taken out. We found that before closing the patient, put in a small piece of catheter and attempted an end-to-end suture. We wondered whether there was too much tension, but felt it was the only thing to do. We established bile drainage and the patient went on for fourteen months and then an obstruction began to develop and we went in and made an incision a little higher in the common duct and took out the tube, which was encrusted with bile salts and virtually occluded. Following this the patient came along all right. That is approximately eight years ago and at the present time there is no trouble.

I think you can leave the tubes in a long time and probably by doing that eliminate the possibility of stricture at the point of suture.

Dr. H. M. Clute: I have had no experience or knowledge of McArthur's operation of which Dr. Hunt spoke. What I would like to emphasize is that a most discouraging situation exists when you have a common duct injury. I believe that it is a general experience among surgeons, that the operative results after injuries to the common duct are poor.

The point that Dr. Miller emphasized should be repeated again and again. Injuries to the common duct may occur in the hands of the most competent surgeons. Fortunately none of these cases had been operated on by either Dr. Lahey or me previously, but they might have been.

ENDOMETRIOSIS*

Report of Two Cases

BY HALBERT G. STETSON, M.D.,† AND JOHN E. MORAN, M.D.†

GROWTHS of endometrial origin have been described in many portions of the abdominal and pelvic region. The largest percentage of these tumors have occurred in the ovary, the rectogenital space, the fallopian tubes and the uterus. Other localities are the umbilicus, small intestine, rectum, broad and round ligaments, groin, cervix, vaginal wall, appendix, wall of the bladder and the epiploic appendages. A few having occurred in an abdominal scar following operation have been reported. Morse and Perry described a type of diffuse endometrioma of the pelvis which constricted the ureters.

Endometrial lesions have commonly been mistaken for carcinomas. Sampson has shown that in many ways, endometriomatous lesions resemble cancers in the routes of dissemination. One rather marked difference is present however, and that difference concerns remote metastases. No endometriomas have been reported in the lungs or brain. Jacobsen attempted to cause endometrioma of the lungs in rabbits by injections of endometriomic suspensions into the ears. He found that the cells were held up in the pulmonary capillaries, and within 24 hours degeneration had occurred and no growth resulted. Further, endometriomas occur only in women.

Graves reported four cases which were treated by oöphorectomy. This treatment resulted in retrogression of ectopic foci. This type of treatment seems feasible in rather diffuse endometriomatous lesions where extirpation of the mass is impossible. The following is the report of such a case.

Miss M. C., aged 33, a clerk, seen October 7, 1926 had always been well. She stated however, that she had always been mildly constipated but that this was readily relieved. October 4, she went about her work as usual but complained of an unusual amount of gas in her bowels. Bowels had moved as usual the day before. On October 4, bowels moved but slightly and did not relieve her flatulence. She had no nausea or vomiting. On October 5, her flatulence increased. She had no bowel movement and expelled no gas, worked as usual but felt uncomfortable and ate practically nothing. On the 6th, she remained at home in bed and felt somewhat nauseated. She had some pain throughout her abdomen, but this was intermittent. The pain was most severe in left side. October 7, she had no movement and expelled no gas. She had had considerable pain throughout the abdomen all day.

Examination: temperature 99°, pulse 80. Lungs and heart normal; abdomen soft and there was some tenderness on deep pressure in the left lower pelvis. Unable to feel any tumor or any very marked tenderness. Abdomen not distended but peristalsis visible and palpable. She was given calomel in divided doses to be followed by a saline. October 8, pain had increased. She had had no movement and expelled no gas. Milk and molasses enema given with good fecal and gas result. October 9, the patient was very uncomfortable throughout the morning. The pain which was present to a mild degree became very marked during the afternoon. Enema gave no result in the morning. Enema on the evening of the ninth gave only a slight fecal result without gas. October 10, the patient was very uncomfortable, abdomen showed some distention but no tenderness or tumor made out. She had a slight bowel movement voluntarily during the night but has passed no gas since that time. Examination showed active peristalsis at this time. Rectal examination showed nothing abnormal. Patient advised to go to the hospital.

On entering the hospital an enema of turpentine and ox-gall was given with no result. Barium enema showed that the patient was able to take less than a pint of barium mixture, and none of the mixture extended above the rectum. The colon was distended throughout with gas. A preoperative diagnosis of intestinal obstruction was made.

Operation: incision to left of median line through the left rectus muscle, extending from pubes nearly to umbilicus. Abdomen opened. Colon found to be much distended with gas, but the small intestine only moderately so. Presenting at the line of incision was a dark blue tumor, evidently of a cystic nature, which had its origin in the pelvis. This was found to come from the posterior surface of the right broad ligament and was apparently of parovarian origin. The obstruction was apparently in the pelvis and it was impossible to learn the character of the obstruction until the cyst was removed. The cyst was clamped off and removed and the stump tied off. The right ovary and tube were normal. The uterus was normal both as to size and position. The left fallopian tube was turned upon itself by a rather long curve around an enlarged left ovary, and the distal end of the fallopian tube was fastened by adhesions in Douglas's pouch. The fallopian tube was about 5 inches long but did not look inflamed; it resembled more the passive, congested type. The left ovary was about the size of a small peach, firmly bound down in the pelvis by adhesions. The left

*Read at the Annual Meeting of the New England Surgical Society, Portland, Maine, September 11, 1931.

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fallopian tube was dissected out and it could be then seen that the sigmoidal obstruction was due to a circular growth at the junction of the sigmoid and the rectum. This growth was firmly adherent to the posterior wall of the pelvis and an attempt was made to carefully loosen this and bring it forward, with the hope of relieving obstruction, but this was not possible. The tumor was nodular, quite firm, and seemed to surround the colon. It was felt that it was impossible to extirpate the mass. Left inguinal colostomy was done and the abdomen closed. The patient had a rather stormy convalescence but gradually recovered. It was felt advisable for the patient to go to Boston for further study. She was referred to Dr. Daniel F. Jones and operated on November 11, 1926. Preoperative diagnosis stricture of the rectum, due to intestinal adenoma of the endometrial tube. No attempt was made at removal of the growth in the rectum. The remaining tube and ovary were removed. This left nothing but the uterus in the pelvis. No attempt was made at closure of the colostomy. The pathologic report is as follows: "Specimen consisted of a completed fallopian tube about 10 cm. in length and in its distal portion it was somewhat dilated, thickened and engorged. On section, purulent material was seen in the lumen. The remainder of the specimen consisted of a large sized ovary and an ovarian cyst. The cyst was about the size of a small orange and greyish pink in color and rather thin walled. The tube was adherent to it. On opening the cyst it was found to be filled with blood stained fluid and clear jelly-like material. The lining membrane was smooth and very vascular but showed no evidence of papillary ingrowth. The other ovary was larger than normal, and the capsule sclerosed. There were numerous follicular cysts but no evidence of pathology. There was submitted in addition, a small piece of soft, yellowish tissue, covered with serosanguineous fluid about the size of a pear. Section microscopically through the ovaries showed sclerosis. In one portion there was seen a corpus hemorrhagicum and in another a follicular cyst. Section microscopically through the tube showed an essentially negative mucosa. There was some thickening of the wall and in the broad ligament there were numerous endometrial implantations. Section microscopically through the soft tissue submitted, showed it to consist largely of scar tissue in which there were endometrial implantations." Diagnosis: "Cystic Ovaries; endometrial implantations."

Following the operation the patient made a good recovery. When seen on January 5, 1927, she had had two normal, yet small defecations in the past week. Diet advised of soft, smooth food. On September 2, 1931, nearly five years later, the patient stated that in April of 1927, she had one menstrual period. This has been the only evidence of menstruation since operation. She has had no "hot flashes" or other vasomotor symptoms. She has been well in every way. The colonic fistula is still present. She has one movement daily through this if she is careful of her diet. If she eats liberally of everything she has more movements. She has a small normal bowel movement per rectum each day without discomfort.

Edwards and Spencer have been credited by Jacobsen with this description of an umbilical endometrioma, "The adenomyoma of the umbilicus occurs in the umbilical cicatrix of women between the ages of 35 and 45, reaching its full development within a few months after appearance, and characterized clinically by redness, swelling, pain and in some instances, by bleeding from the tumor at the menstrual period." A case of endometrioma of the umbilicus is herewith presented.

Miss R. N., aged 35, school teacher, complained of some discomfort about the umbilicus for the past year. This trouble seemed most marked about the time of menstruation. She had a normal appetite, and good digestion. She was always constipated however, but this was readily relieved by laxatives and by diet. She had recently noted a little discharge from the umbilicus and had a good deal of tenderness about this region, and it was stated that clothing sometimes caused irritation. Menstruation was regular every 24 or 25 days, lasted 3 days, moderate in amount with no pain. General physical examination was negative with the exception of the umbilicus. At the umbilical region there was a small localized swelling about the size of a peach, moderately tender and tense. No opening found in this mass. There was no evidence of any bulging or impulse on coughing or straining. At time of examination there was no discharge. A preoperative diagnosis of probable infected urachus was made. Operation advised and accepted.

December 22, under novocaine anesthesia, a circular incision was made about the umbilicus. The subcutaneous tissue and fascia were separated from the umbilical remnant. On reaching the linear alba there was found to be a separation with some protrusion of the peritoneal cord. The umbilicus was removed by dissection and the peritoneum approximated. The rectus fascia was then closed and the skin approximated. The postoperative convalescence was normal. The pathologic report follows: "Specimen consisted of a piece of skin measuring about 2 x 2 cms. with an umbilicated center, together with the underlying tissue, to a depth of about 1.5 cms. Sections made parallel with the surface showed fibrous tissue with two or three small pockets of gelatinous material embedded in it. Microscopic examination showed numerous islands of gland structures composed of tall columnar epithelium, and surrounded in most cases by a zone of embryonic cells characteristic of the stroma of uterine mucosa. The gland structures, for the most part are similar to those of normal uterine mucosa, but in places there is a slight papillary infolding. Many of the gland structures are dilated with thinned out epithelium and with that of endometrial implantation, but the lesion is possibly congenital in origin. Evidence of malignancy is lacking. Diagnosis, Ectopic Endometrium."

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Discussion

Dr. Robert B. Greenough: If I may, I should like to say that Dr. Stetson's paper is of interest to me. I had a case similar to his, with endometrioma of the sigmoid after a hysterectomy, which showed perfectly definite periodic twenty-eight day attacks of intestinal obstruction which were so definite that we hazarded the guess that it was an endometrioma and so it proved to be.

THE COST AND EFFECT OF MENTAL AILMENTS

According to Horatio M. Pollack of the New York State Department of Mental Hygiene, the economic loss due to mental ailments is estimated to be about $742,000,000 each year in the United States.

This huge sum includes the average annual earnings of over ninety thousand first admissions and the rest covers hospital maintenance and services to patient.

Another factor brought out by B. Malzberg, statistician of this department, is that the mortality among the mentally diseased is three to six times that of the general population.

It is the consensus that mental diseases are increasing in this country and the importance of the application of efforts looking to prevention of mental illness should be one of the major problems before the country. The recognition of the great and increasing burden of these afflicted persons is apparently little appreciated outside the ranks of psychiatrists and statisticians.

COLUMBIA RAISES MEDICAL STANDARDS

Columbia University, it was announced recently by the University Council, has taken the lead in establishing higher standards in the practice of surgery and other specialized branches of medicine by its adoption of the degree of Master of Science in postgraduate medical education.

The degree, according to the announcement, requires a period of study of not less than three years following graduation from a recognized medical school, and the completion of an internship of not less than one year. At least one of the three years of postgraduate work must be spent at Columbia University in intensive training in the basic medical sciences.

Dean Willard C. Rappleye, in commenting on this step, which he characterizes as "having important significance of a public character", points out that the present requirements for the practice of surgery and the clinical specialties do not guarantee the ability of such specialists in their various fields. In establishing the new degree the university has adopted a standard of training in each of the clinical specialties, successful completion of which will carry the degree.

PURE VITAMIN D

It has been announced that Dr. Robert Bourdillon and others, experimenting at the National Institute for Medical Research in London, have isolated a substance which they believe to be pure vitamin D.

This substance, white and crystalline in character, has been named calciferol.

CANCER RELIEF FUND

The will of Dr. John Edmund MacKenty, former senior surgeon of the Manhattan Eye, Ear, Nose and Throat Hospital, who died on December 11, provides $50,000 for a "MacKenty Fund," the income of which is to be used for educational propaganda on cancer of the larynx and to help defray expenses of charity patients operated on at the hospital for this affliction.

PARAPLEGIA ASSOCIATED WITH NON-TUBERCULOUS KYPHOSCOLIOSIS; A CASE REPORT AND A SURVEY OF THE LITERATURE*

BY HENRY R. VIETS, M.D.,† AND MILTON HENRY CLIFFORD, M.D.†

IT is generally considered that curvature of the spine seldom interferes mechanically with the functions of the spinal cord. Such an opinion is based on the observation of a large number of patients presenting residual scoliosis, often of a very marked degree, after poliomyelitis, rickets, or congenital defects, with no evidence of cord compression. If a patient with non-tuberculous scoliosis, moreover, develops signs of cord compression, that compression is usually due to spinal cord tumor, spondylitis, abscess, trauma, or a super-imposed disease such as syringomyelia. The following is the account of a case seen in the neurological wards at the Massachusetts General Hospital in which paraplegia developed from mechanical compression of the spinal cord by scoliosis. The literature of the subject is also reviewed.

CASE REPORT

W. F. M. (M. G. H. 313089), male, aged 18, was admitted to the Neurological Service of the Massachusetts General Hospital on April 13, 1931 with complete paralysis of both legs. Poliomyelitis, fifteen years before entrance, had left a well-marked residual kyphoscoliosis with some weakness of the flexor muscles of the feet, right shoulder, and right triceps muscle, and a bilateral pes cavus, more marked on the left side. In spite of his disabilities, which were noted in the out-patient department of the hospital two years before the onset of his present illness, he was able to get about. Nine months before entry, however, he noticed that his legs were becoming weak and his disability progressed until six months before entry, when he began to stagger; three months later he had to use crutches. About two and a half weeks before he entered the hospital the patient noted, besides the weakness, some numbness of his legs and the lower part of his trunk. There was no sphincter disturbance and no pain. His condition had come on without previous trauma.

On entrance to the ward, except for the structural deformity of his back and his neurological condition as noted below, the patient was free from disease. There was a marked kyphosis of the upper thoracic spine and some left thoracic scoliosis, with lordosis of the lumbar spine. Slight atrophy of the muscles of the right shoulder girdle, the right upper arm and the left lower leg, with bilateral pes cavus, were also observed. In addition, there was complete paralysis of his legs except for slight ability to extend his lower legs when they had been flexed at the knee. His legs were somewhat spastic, although the knee jerks were equal and only slightly hyperactive, while the ankle jerks were normal. There was no ankle clonus, but the Babinski, Gordon and Oppenheim reflexes were well marked. Sensation to touch, pain, and temperature was impaired below the level of the sixth thoracic segment of the spinal cord.

X-ray examination of the spine showed a kyphosis

FIG. 1. X-ray showing kyphosis of the upper thoracic spine.

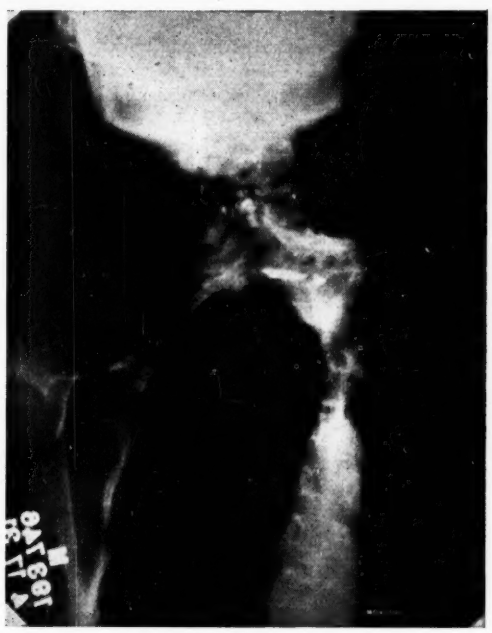

FIG. 2. X-ray showing arrest of lipiodol at apex of angulation.

of almost 90 degrees in the upper thoracic region (Fig. 1). At the site of the greatest deformity three

*Read before the Boston Society of Psychiatry and Neurology, October 22, 1931.

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wedge-shaped vertebrae could be seen (not all clearly shown in the photograph of the x-ray), two of which were flattened to about one-half their normal size. The outline of the deformed intervertebral spaces was preserved. There was lordosis of the lumbar vertebrae without deformity of the bodies or joint spaces and upper thoracic scoliosis with deformity of the left chest (Fig. 2). It was thought that the wedge-shaped vertebrae in the upper thoracic spine were possibly due to an old fracture, although no history could be obtained from the patient to justify this conclusion, and there was certainly no trauma directly before the onset of the paraplegia.

Combined cisternal and lumbar puncture demonstrated a partial block in the subarachnoid space. The response to jugular compression in the lumbar needle was slow and uncertain; 66 mgms. per 100 c.c. of total protein were found below the block, compared to 22 mgms. above. The Wassermann test on both the blood and spinal fluid was negative. Lipiodol, injected into the cistern, was delayed in its descent at the upper border of the kyphosis, but eventually passed into the lower thoracic region, again demonstrating the partial nature of the block (Fig. 2).

After ten days on a Rogers hyperextension frame no improvement could be demonstrated in the paralyzed extremities. In view of this, and because of the block in the subarachnoid space, operation was considered advisable.

Three and a half weeks after entry, Dr. John S. Hodgson removed the laminae from the seventh cervical to the third thoracic vertebrae inclusive. The dura, which bulged posteriorly, was observed not to pulsate, apparently being under extreme tension at the point of maximum curvature. The dura was opened throughout the entire length of the operative field and laterally incised at its upper and lower limits. The spinal cord, after this procedure, herniated through the opening. Pulsation of the cerebrospinal fluid was established, and a catheter passed with ease upward and downward at the limits of the incision. The dura was left open, without drainage.

For four days after operation the patient had to be catheterized, after which time he had no sphincter disturbance. During the same period he complained of frequent severe shooting pains, chiefly in the legs. These gradually disappeared, together with occasional paresthesia, over a period of two weeks. Sensation began to return in the feet after three weeks, although a lumbar puncture performed at this time still showed evidence of partial block. There was no improvement in motion and the reflexes remained unchanged a month after operation. A plaster jacket was applied and the patient discharged from the hospital. Two months after operation sensation had completely returned; the patient was able to move his legs and to walk with the support of two assistants, although the legs were still spastic. There was no change in the reflexes.

Six months after his operation the patient could walk without support and was able to swim. There was no pain or sensory loss and sphincter action was normal. His gait was slightly spastic and ataxic and the bilateral Babinski was still present. The patient considered his legs "normal".

SURVEY OF THE LITERATURE

Seventeen reports of patients with paraplegia caused by spinal curvature mechanically compressing the spinal cord were found in the medical literature. The earliest is that of Mauclaire[1], in 1913. His patient, an adolescent, developed cervical curvature without known cause in 1910. A year later the kyphosis had become marked, with a turning of the head to the left and a slight compensatory dorsal twist. At the same time there developed an incomplete paraplegia with noticeable atrophy of the legs associated with mass reflexes. In the arms the reflexes were less active on the right than on the left. The right pupil was smaller than the left. Sensation of all types was diminished from an indefinite level on the abdomen, downward. X-ray examination showed all the cervical vertebrae pushed forward to form an open angle with its summit at the seventh cervical and first dorsal levels. Treatment consisted of the use of a corset and a brace. Improvement was immediate and the patient was considered completely cured in two years.

In 1916 Ridlon[2] reported an incomplete and somewhat atypical case of an eleven year old girl who had had spinal curvature "for some time" with marked wedging of the thoracic vertebrae. There was an extra rib growing from the ninth thoracic vertebra. While wearing a correcting corset, the patient developed a spastic paraplegia with some fecal but no urinary incontinence, six months before she was observed by Ridlon. There was no sensory loss. She was treated by hyperextension and at the end of four months it was noted that the reflexes were normal, but no further report was made.

Kleinberg[3], in 1923, described the case of a nine year old girl who, at the age of seven, developed, insidiously, a right thoracic rotary lateral kyphoscoliosis. A year and a half later spastic paraplegia was noted, which progressed up to the time that she was seen. On hyperextension, after two months without improvement, she began to show signs of returning power in her legs and ultimately improved to a marked extent.

Jaroschy has reported five cases, two in 1923[4] and three in 1928[5]. His first case was that of an eighteen year old boy with marked spinal curvature since early childhood. One year previous to entry the patient developed numbness of his thighs, followed by weakness and then complete loss of ability to use his legs. There was well-marked scoliosis with some kyphosis when he was first seen. His legs were spastic and sensation was diminished up to the level of the sixth thoracic segment. Examination of the spinal fluid was reported as negative except for an increase in the amount of protein below the point of compression. X-ray examination showed the vertex of the deformity at the fourth thoracic vertebra, which was wedge-shaped. At operation, a pad of epidural fat was found with the dura stretched tightly over the promontory of the kyphosis. The dura was cut and left open, and ten weeks after operation sensation had returned completely and motion partly. At the end of ten months the patient could walk with crutches, but no further improvement was noted eighteen months after operation.

The second case reported by Jaroschy is that of a fourteen year old girl who developed curvature of the spine at the age of two. Five

weeks before she was seen, the legs became weak and spastic and within two weeks she was unable to walk. There was no history of pain, sphincter disorder or sensory disturbance. The scoliosis, with a marked kyphosis, was in the upper thoracic vertebrae. There was an increase in the protein in the spinal fluid below the point of compression. Treatment by hyperextension was tried for three weeks without relief. This was followed by an operation, at which, because of excessive bleeding, it was thought inadvisable to open the dura. Following this operation there was marked cystitis and urinary incontinence. A second operation, two weeks after the first, revealed the dura so taut that the spinal cord herniated through the opening when the dura was cut. No other cause for the compression was found. Seven months later the patient could walk for a short distance and a year later she was considered completely cured.

The third case was that of a nineteen year old boy who, although he had had scoliosis since early childhood, had only been bothered by occasional incontinence for three years and weakness of his legs for six months. There was a marked left convex scoliosis, with distinct kyphosis from the fourth to the tenth thoracic spine, with a 90 degree angle at the eighth thoracic vertebra. The legs were paralyzed and sensation was diminished to a level two fingers above the umbilicus. Examination of the spinal fluid showed a block in the subarachnoid space and lipiodol was almost completely checked at the seventh to eighth thoracic vertebrae. Laminectomy was performed and an epidural fat pad found at this level. The dura was under great tension and when cut, the spinal cord herniated through the opening. The nerve roots were so stretched by the mechanical difficulty that some of them had to be cut and the dura was left open. Sensation improved within two days. A month later the patient was able to walk and in three months appeared practically normal except for a somewhat spastic gait. A year and a half later, although the patient was slightly spastic, he was able to work.

A fourth case reported by Jaroschy was that of a nineteen year old boy who developed scoliosis at two years of age following rickets. Nine months before he was seen, the patient noticed paresthesia of the legs and some weakness. On admission to the hospital there was a well-marked kyphoscoliosis from the fifth thoracic to the first lumbar vertebra with a right-angle kyphosis, most marked at the seventh and eighth thoracic vertebrae. There was spastic paraplegia with diminution of sensation up to the ninth thoracic vertebral level. Lipiodol injected above the lesion was completely blocked at the level of the eighth thoracic vertebra. At operation the dura was found under tension and the cord prolapsed when the dura was incised. The dura was left open. Six weeks later sensation had improved and the patient was able to get out of bed. In two months he was walking and fifteen months after operation he appeared to be completely well.

Jaroschy's last case is that of a twenty-eight year old woman who had had spinal deformity since childhood. She wore a corset brace from her sixth to her fourteenth year. She had fallen a number of times but not, apparently, directly on her deformed spine. A year before she was seen, she developed weakness of the legs with occasional pains in the lumbar region. At the time she entered the hospital there was a moderate kyphotic deformity, with the apex at the seventh thoracic vertebra, a spastic paraplegia, and an irregular sensory loss at the level of the sixth thoracic vertebra. Lipiodol was completely blocked at the fifth thoracic vertebra. She refused operation and was put in a plaster cast. Fifteen months later there was practically no change in her condition.

Two cases were reported by Elmslie[6] in 1925. The first patient, a boy, eighteen, developed scoliosis following poliomyelitis at the age of seven and at sixteen began to have progressive weakness of the legs. Paraplegia became so severe that the patient was unable to walk for a year and a half before he was seen. There was no pain or sphincter disturbance. On examination it was found that the apex of the scoliosis was at the level of the fifth thoracic vertebra. There was also complete spastic paraplegia with anesthesia up to within two inches of the xiphoid process. Cisternal puncture, with the injection of lipiodol, confirmed the diagnosis and the location of the block. At operation the dura was found tightly stretched over the apex of the angulation. Although the dura was incised and an attempt to decompress the cord was made, the results were not good. There was no improvement at the end of three months and extension was tried; at the end of six months only slight return of tactile sensation was observed. The patient's condition was somewhat improved at the end of a year.

Elmslie's second case was that of a twelve year old boy who developed scoliosis at six or seven years of age. At eleven, paralysis of the legs was noted and for two months before admission the patient had retention of urine. Examination showed a severe scoliosis from the seventh cervical to the fourth thoracic vertebra with complete spastic paralysis of the legs and normal sensation. Lipiodol was blocked at the first thoracic vertebra. At the time of Elmslie's report, no treatment had been instituted.

Another case was reported by Collier[7] in 1925. This patient was a sixteen year old girl, who developed a scoliosis at three or four years of age, subsequent to poliomyelitis. Eighteen months before entry she began to drag her legs and a year later there was difficulty in bladder control. She had no pain and was able to walk

Case		Age	Sex*	Etiology of Scoliosis	Place of Curvature	Onset Neurol. Sympt. (Progressive Paralysis of lower limbs)	Pain (except postoperatively)	Sensory Loss?	Sphincter Disturb.?	Treatment	If Operation: Fat pad	If Operation: Dura left open	Remarks
1.	W. F. M. (MGH)	18	M	Polio. at 3	T_1-T_3	9 mos.	No	Yes	No	Laminectomy	Yes	Yes	Some improvement in 2 mos.
2.	(Mauclaire)	? (adolescent)	M	?? (rheumatic 2 yrs. before entry)	Max. C_7-T_1	? less than 1 yr.	No	Yes	—	Corset and brace	—	—	Practically complete improvement over 2 yrs.
3.	(Ridlon)	11	F	Congenital (since childhood)	Mid-dorsal (extra rib at T_9)	½ yr.	None mentioned	No	Some fecal	Hyperexten.	—	—	Improved in 4 mos.
4.	(Kleinberg)	9	F	Congenital (noted at 7)	T_5 & T_6 (T_7-L_2 abnormal)	½ yr.	No	None mentioned	—	Hyperexten.	—	—	No improvement for 2 mos., after which there was marked improvement.
5.	(Jaroschy Case 1)	18	M	Congenital (since childhood)	Max. T_4	1 yr.	No	Yes	No	Laminectomy	Yes	Yes	Marked improvement in 10 wks. and walking with crutches in 10 mos.
6.	(Jaroschy Case 2)	14	F	Congenital (noted at 2)	Upper thoracic	5 wks.	No	No	No	Extension	—	—	No help from extension.
										Laminectomy	—	Yes	After laminectomy great improvement in 7 mos. and complete in 1 yr.
7.	(Jaroschy Case 3)	19	M	Congenital (childhood)	T_4-T_{10} Max. T_6-T_8	3 yrs. more or less incont. 6 mos. weak. of legs	No	Yes	Yes	Laminectomy	Yes	Yes	Entirely well in 1½ yrs.
8.	(Jaroschy Case 4)	19	M	Rickets at 2	Max. T_7-T_8	9 mos.	No	Yes	—	Laminectomy	—	Yes	Entirely well in 15 mos.
9.	(Jaroschy Case 5)	28	F	Congenital (noted in childhood)	Max. T_7	1 yr.	Yes (lumbar)	Yes	—	Plaster cast for 1 mo.	—	—	No change in 15 mos.

Case		Age	Sex*	Etiology of Scoliosis	Place of Curvature	Onset Neurol. Sympt. (Progressive Paralysis of lower limbs)	Pain (except postoperatively)	Sensory Loss?	Sphincter Disturb.?	Treatment	If Operation: Fat pad	If Operation: Dura left open	Remarks
10.	(Elmslie Case 1)	18	M	Polio. at 7	Max. T_5	2 yrs.	No	Yes	No	Laminectomy	—	Yes	No improvement after operation in 3 mos.
										Hyperexten.	—	—	Little improvement with extension in 1 yr.
11.	(Elmslie Case 2)	12	M	Congenital (noted at 6-7)	C_7-T_4 Max. T_3	1 yr.—slight	None mentioned	No	Yes	—	—	—	———
12.	(Collier)	16	F	Polio. (?) at 3-4	Mid-thoracic	18 mos.	No	Yes	Yes	—	—	—	———
13.	(Sachs)	14	M	Injury at 3	Max. T_7	1 yr.	No	Yes	Yes	Laminectomy	Yes	Yes	Well in 4 wks. (wearing celluloid jacket).
14.	(McKenzie)	18	M	Congenital (noted at 7-8)	Mid-thoracic	1 yr.	No	Yes	Some	Bradford frame for 2 mos.	—	—	Worse after extension.
										Laminectomy	Yes	Yes	Well in 9 mos. after laminectomy.
15.	(Lehrnbecher)	17	M	Congenital (noted in childhood)	Max. T_9	6 mos.	None mentioned	Yes	Some	Extension	—	—	Marked improvement.
16.	(Bergmann Case 1)	19	M	Polio. at 3	T_3-T_5	1 mo.	No	Yes	Urinary difficulty	—	—	—	———
17.	(Bergmann Case 2)	13	M	Rickets in childhood	T_5-T_8	6 mos.	No	Yes	—	—	—	—	———
18.	Siebner	22	M	Rickets in childhood	Max. T_9	5 wks.	No	Yes	No	Extension	—	—	Worse at first with urinary disturbance in 4 wks. and high grade paraplegia at 6 wks. Then slow improvement and nearly well in 1 yr. Completely well 3 and 5 yrs. later.

*M=Male
F=Female

with the aid of a jacket. Examination showed a marked scoliosis, partial spastic paralysis of the lower limbs, and partial anesthesia up to the seventh or eighth thoracic vertebra. Spinal fluid examination showed the compression syndrome of Froin. No treatment had been given at the time of Collier's report, but he suggested operation if rest and extension did not relieve the condition.

Sachs[8] reports an unusual case of a fourteen year old boy, first seen in 1925. Subsequent to an injury at the age of three, the patient developed prominence of the left shoulder. At thirteen, weakness of the legs with some loss of sphincter control was noted. When first seen by Sachs there was a marked thoracic kyphoscoliosis, spastic paraplegia, and a diminution of sensation below the level of the umbilicus. At operation a pad of fat was found over the dura, at the point of maximum curvature. The spinal cord was somewhat thinner than normal, but prolapsed readily when the dura was cut. Four months after operation the patient was able to walk, wearing a celluloid jacket.

McKenzie[9], in 1927, reported a somewhat similar case of a boy eighteen years of age whose spine had been slightly curved at the age of seven or eight and obviously so at the age of ten or eleven. A year before he was seen, weakness of the legs developed and two weeks before entry to the hospital the patient could hardly walk. There was numbness of the legs and incontinence of urine but no pain. The legs were found to be very spastic and his condition progressed in spite of two months on a frame with extension. Lumbar puncture revealed the presence of a block in the subarachnoid space and lipiodol was arrested at the point of maximum compression. As in Sachs' case, at operation a pad of fat was found in the epidural space. The dura was incised and the cord prolapsed through the opening. Two days after operation bladder control returned and movement of the ankles was observed. Nine months later the patient was entirely well and the only evidence of his paralysis was found in the hyperactive knee jerks with slight spasticity.

Lehrnbecher[10] reported, in 1928, a case of a boy seventeen years of age who had had scoliosis since youth. Spastic paraplegia developed slowly over a period of six months; there was a definite sensory impairment with partial loss of sphincter control. The kyphosis was most marked at the level of the ninth thoracic vertebra and lipiodol injected into the subarachnoid space showed a block at this level. Treatment by extension on a convex bed was successful; in three months sensation began to return and soon there were movements of the toes; in six months the patient could walk with two canes, although the legs were spastic.

Two untreated cases were reported by Bergmann[11] in 1929. The first was that of a nineteen year old boy with a residual scoliosis following poliomyelitis at the age of three. Paraplegia came on suddenly about a month before the patient was seen. There was loss of sensation and difficulty in urination. Examination of the spinal fluid did not show evidence of block, but lipiodol was arrested at the level of the seventh vertebra.

In Bergmann's second case scoliosis developed in a boy of thirteen after rickets in childhood. Paralysis came on slowly, beginning six months before he was seen. Lipiodol injected into the subarachnoid space was blocked at the level of the sixth thoracic vertebra. Examination by lumbar puncture was said to be negative.

Siebner's[12] patient was a young man aged twenty-two, who had developed scoliosis following rickets in early youth. Weakness of his legs began about five weeks before he was seen and progressed so that walking was impossible. There was no pain or sphincter disturbance and physical examination showed nothing abnormal except the scoliosis with kyphosis, the vertex of the angulation being at the ninth thoracic vertebra, and spastic paralysis of the legs with loss of sensation. Treatment was by extension and during the first six weeks after the treatment was started the patient appeared to be distinctly worse. Improvement, however, occurred slowly after that time without change in the treatment and the patient was discharged to light work within a year. Five years later he was reported as well.

DISCUSSION

Statistics. A review of the eighteen reported cases of paraplegia caused by kyphoscoliosis shows the following: The ages of the patients when first under observation for the paraplegia varied from nine to twenty-eight years, the average being slightly over sixteen; thirteen were males, five females; the cause of the scoliosis was congenital in nine cases, poliomyelitis in four, rickets in three, injury in one, and unknown in one; the maximum curvatures were: mid-thoracic, ten, high thoracic, five, low thoracic, two and low cervical, one; in six cases where the date of onset of the scoliosis (due to poliomyelitis, rickets or injury) could be definitely ascertained, the interval before paraplegia developed varied from nine to sixteen years, with an average of twelve and one-half years. In the other cases the first signs of congenital scoliosis were so vague as to make the statistics unreliable.

Root pain was only noted in one case; loss of sensation was the rule, occurring in fourteen out of eighteen cases; sphincter disturbance was noted in eight cases; spastic paralysis occurred in all.

Treatment, in the majority of the cases, consisted of hyperextension of the spine or lamin-

ectomy, or both; plaster cast or corset and brace was used twice; four patients had received no treatment at the time the reports were made. One patient improved to nearly complete recovery with only a corset and brace; another did not improve wearing a plaster cast. Four patients were treated conservatively with hyperextension; all did well, two showing marked improvement and one was completely well at the end of three years. Five patients were operated upon; one showed some improvement in two months, another marked improvement in ten months, a third was entirely well in one and one-half years, a fourth entirely well in fifteen months, and the fifth well in one month. Three other patients received both hyperextension and laminectomy; one was not improved by hyperextension but was completely cured by operation; one was not improved by either hyperextension or laminectomy; another, made worse by hyperextension, was cured by laminectomy.

In the eight operated cases, a fat pad at the site of angulation, was found in five; the dura was left open in all the patients treated by laminectomy.

Symptomatology. The paraplegia usually appears eight to sixteen years after the development of the scoliosis. The onset is insidious, beginning as paresthesia of the feet and progressing to spastic paralysis with sensory and sphincter involvement. About a year elapses from the time of the first symptom before the patient comes to a physician, although some cases run a more rapid course of only a few weeks' duration. Pain rarely occurs. In every case there is a well-marked gibbus with angulation, usually in the thoracic region. Most patients show dynamic and chemical block in the subarachnoid space and lipiodol is arrested at the point of maximum pressure.

Treatment. Hyperextension of the spine by a convexed frame is the most conservative method of treatment. By using a bed of the Rogers pattern the hyperextension can be increased from time to time up to the point of maximum convexity. The results of this treatment are good in about one-half of the cases; those patients who do not do well after a few months usually submit to operation. Patients rarely do well by the use of a simple corset and brace. Laminectomy is the treatment of choice in most cases, but should only be used after a trial of more conservative methods. Striking tension of the spinal dura at the point of maximum angulation is nearly always found, with a fat pad covering the spinal cord in the same area. The dura should be left open after decompression of the spinal cord. A few of the results of operation are brilliant, particularly in the cases reported by Sachs, McKenzie and Jaroschy (Cases 2, 3 and 4).

CONCLUSIONS

1. Pressure paraplegia may occur as the direct result of angulation of the spinal cord secondary to severe kyphoscoliosis.

2. The paraplegia usually appears after many years of scoliosis, without predisposing trauma.

3. The paralysis, spastic in type, is associated with sensory changes below the point of compression, sphincter weakness and, rarely, pain.

4. Block in the pathway of the spinal fluid may be demonstrated by pressure studies and by the injection of lipiodol.

5. Some patients are relieved or even cured by hyperextension of the spine, but most patients require surgical decompression of the impinged spinal cord at the point of maximum angulation of the spine.

6. The prognosis, with appropriate treatment, is often good and sometimes excellent.

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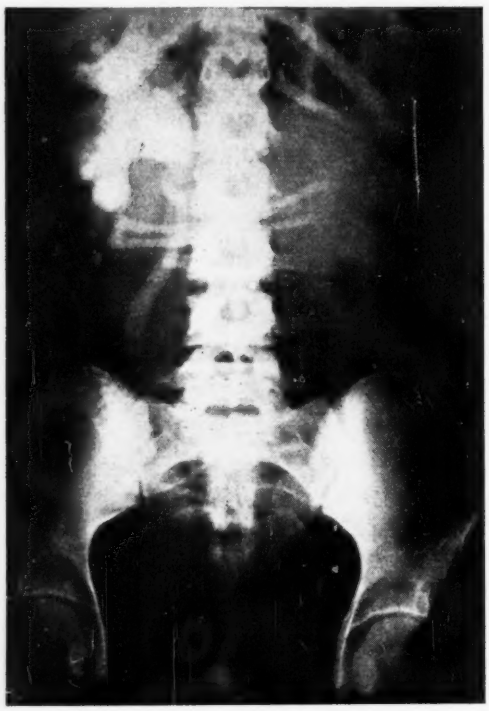
INTRAVENOUS PYELOGRAPHY DURING PREGNANCY*

BY GEORGE C. PRATHER, M.D.,† E. GRANVILLE CRABTREE, M.D.,† AND SAMUEL A. ROBINS, M.D.†

FREQUENTLY there are occasions during pregnancy where pyelographic data are desirable for a kidney diagnosis, but in which cystoscopy is not especially indicated. Such might be the case with a lone kidney in a pregnant patient, or perhaps patients having pain indicative of kidney pathology but showing a negative urine. Intravenous pyelography is the procedure of choice in such a problem providing there is nothing to be gained therapeutically by cystoscopy.



Intravenous pyelogram, lone kidney. Sixth month of pregnancy. Urine: Negative.

The present report concerns the first thirty-six intravenous pyelographic examinations done at the Boston Lying-In Hospital. We have used intravenous pyelography purely for diagnosis. Eighteen were so examined because of a history of previous urinary tract pathology. Six were suspected of having lone kidneys. Six had pain indicative of kidney pathology with negative microscopic sediments, and six examinations were done in patients with mild toxemia. Thirty of the examinations were done during pregnancy, six in postpartum cases.

Technique: Uroselectan was used in 32. Iopax was used in four. The usual adult dose was used (40 grams uroselectan, 30 grams iopax dissolved in 120 c.c. of sterile water) sterilized and given intravenously by gravity in five to seven minutes.

Reactions: There were no serious complications. All complained of feeling intensely warm about the face and neck simultaneously with evident flushing of the skin in that region. These symptoms and signs were accompanied by thirst, beginning when approximately one-half of the solution had been given and ceasing within four minutes after the administration had been completed. A few had pains in the corresponding shoulder of the arm which was used for injection. The above symptoms have been reduced to a minimum since using skiodan in a group not included in this report. None stayed in the hospital longer than was necessary for the x-rays, and only two of the 36 reported headaches, nausea and dizziness after they returned home.

Intravenous pyelogram, mild pyelitis. Eighth month of pregnancy.

Roentgenographic technique: Technique used at the Boston Lying-In Hospital is as follows: 100 kilovolts (six inch spark gap), 30 milliamperes, 28 inch film target distance, five to nine seconds exposure (depending on the size of the patient). The exposures were made on a Bucky diaphragm and one millimeter of aluminum filter was used. Three or four 14 x 17 films were used, each covering the entire urinary tract; one preliminary exposure, one 5-15 minutes after

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the intravenous injection, another one-half hour later and sometimes one 60 minutes after the injection.

Percentage of satisfactory plates: With the dilation of the upper urinary tract so common in pregnancy, one would expect a higher percentage of satisfactory plates during intravenous pyelography than in non-pregnant patients without that same dilation. Such reasoning is supported by the fact that x-ray plates sufficiently good for diagnosis were obtained in 33 of the 36 examinations. These films showed excellent concentration of the opaque media and gave good contrast. One of the failures occurred in a lone kidney patient who by laboratory tests was known to have very poor kidney function. The second was in a patient who later proved to have normal kidneys by retrograde pyelography. The third was in a patient diagnosed as a toxemia of pregnancy. Of 27 examinations during pregnancy yielding satisfactory pictures, the best film in 17 of these was taken 5-15 minutes after the injection was completed. In seven patients the 30 minute film was best, while in two the 45 minute plate proved to be more satisfactory. In only one was the 75 minute plate the best. Of six postpartum examinations the best film in four patients was obtained five minutes after completing injections, the other two being best on the 15 minute film.

Intravenous pyelogram during fifth month. Urine: Negative.

Obstetric complications: Of 27 patients who had intravenous pyelograms during pregnancy, 25 have been delivered. There were no complications during the remainder of the pregnancy or at delivery except in one toxemia who developed albumin and whose delivery was induced three weeks before term.

Fetal complications: We must always keep in mind the possibilities of latent injury to the offspring by excessive exposure of the fetus to the roentgen ray. This is especially true during the early stages of pregnancy. The younger the fetus the more susceptible it is to the effects of the roentgen ray.

With this technique we have never observed any injury to the fetus during four years at the Boston Lying-In Hospital, and in some cases several roentgen examinations were made during the course of the same pregnancy for pyelographic and other studies.

It is reasonable to believe that the amniotic fluid absorbs some of the rays and acts as a filter to protect the sensitive tissues of the fetus from the roentgen ray. From our observations a total of 18 milliampere minutes of exposure is attended without danger to the fetus or mother.

Of the 25 babies born to these mothers who had intravenous pyelograms during pregnancy, two had complications. Both, however, occurred in toxemic mothers. One baby had convulsions a few days after birth, the other being a premature delivery which developed bronchopneumonia. Radiation was in no way held responsible.

Conclusions: (1) Intravenous pyelography is useful during pregnancy where a kidney diagnosis is desirable but in which cystoscopic examination is not indicated. (2) Satisfactory films can be obtained in at least 91%. (3) The majority of best plates are obtained 5-15 minutes after completing the injection. (4) There were no obstetric complications that could be in any way related to the examination. (5) With the roentgenographic technique described, there seems to be no danger to the fetus either from the solution injected or from the roentgen ray.

THE DEVELOPMENT OF THE REST TREATMENT IN PULMONARY TUBERCULOSIS*

BY JOSEPH H. PRATT, M.D.†

I APPRECIATE deeply the privilege extended to me by the Commissioner of Health, Dr. Bigelow, of taking part in this celebration, because I regard it not only as an honor to me personally, but as a recognition of the value of the prolonged bedrest treatment in the cure of pulmonary tuberculosis.

I have watched, for many years, with great satisfaction the employment of this form of treatment in this sanatorium, by my old friend, Dr. Emerson, and I congratulate him today on the success of his demonstration and the great good he has accomplished. The first official designation of this institution in the acts of incorporation was not "sanatorium" but "hospital for the tuberculous". There was more significance in this original name than its authors realized, for, in the light of present-day knowledge, it is hospital treatment that is indicated in active tuberculosis. It is hard for some of us to realize that the battle for strict rest treatment in tuberculosis has been won.

Knowledge of pulmonary tuberculosis and its cure has made mighty strides in the past fifty years. Many diseases are self-limited and their cure is the result of natural processes, but not so consumption. Throughout the ages until recent times, labeling a case, even in the early stage, with this diagnosis, was equivalent to a death sentence.

Discoveries regarding the disease were counter to prevailing views and hence spread slowly. Villemin, in 1865, proved by animal experiments that the disease was infectious and could be transmitted from man to rabbits. Robert Koch, in 1881, discovered the tubercle bacillus and proved it was the cause. Yet, two years later, in 1884, a learned writer in a leading American medical journal, in a carefully prepared article on the climatic treatment, said, "We know the cause of the disease. It is due to damp soil!"

Until Koch's discovery, Virchow's error that tuberculosis and consumption were different diseases was generally held, and made confusion worse confounded. Students were taught Niemeyer's dictum that the greatest evil which can happen to a consumptive is that he should become tuberculous! Only one great teacher in the decade before Koch's great discovery held to Laennec's doctrine of the unity of tuberculosis and phthisis; that was Austin Flint. I have heard Dr. Welch relate that when he, a young bacteriologist, returned to New York from studying in Koch's laboratory in Berlin, Professor Flint called at his lodgings at an early hour, the morning after his arrival, eager to learn details of Koch's wonderful discovery, which proved the truth of Flint's own views.

Medical treatment among the general population often lags many years behind the knowledge of the leaders of the age. When I was a freshman at Yale, forty years ago, my roommate developed pulmonary tuberculosis. The leading physician in New Haven was called in consultation. All he could suggest to the practitioner in charge of the case was pure beechwood creosote. Not a word about change of climate! Trudeau's sanatorium was then open, but it was not mentioned. The patient's temperature was not followed, although he had fever at onset. He was allowed to remain in the city and to wander about at will. With only a broken reed in the form of creosote to support him, he was allowed to remain in the city while the disease was permitted to advance. Nothing was even suggested as to the danger of infection to others of the household.

The new truth gained acceptance slowly. In 1885, over three years after Koch's discovery, Dr. Beverly Robinson, a well-known clinical teacher in New York, thus addressed his students. "Only a few months ago the chorus of the supporters of Koch was somewhat after this fashion; What is consumption? The bacillus. What is the bacillus? Consumption. But what causes consumption? Why, the bacillus. But what causes the bacillus? Consumption. And now I ask, in the words of Professor Loomis, whether they (these microbes) are the cause or the scavengers of the disease?"

Truly John Locke was right when he stated that "the truth scarce ever yet carried it by vote anywhere at its first appearance".

The successful treatment of pulmonary tuberculosis began with Herrman Brehmer, long before the discovery of the tubercle bacillus. He established the first sanatorium for tuberculosis, at least the first that survived. It was located at Görbersdorf in a mountain valley of Silesia. In his book published in 1887, he stated that he had treated thirteen thousand patients. There is no doubt that his method produced cures in favorable cases and that was something no other plan of treatment previously used had ever done. When he claimed, in medical circles, that he had cured the disease, he was called a charlatan. Medical authorities never endorsed him or his views. He held theories since proved to be false, but they, fortunately, led him along the right path, so far as treatment was concerned.

*Read at the opening of the New Medical and Surgical Building at the Rutland State Sanatorium, Rutland, Mass., June 26, 1931.

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In tuberculosis he accepted Rokitansky's teaching that the heart was too small and that it must be strengthened by carefully regulated exercise. He believed, in theory, that exercise was the means of cure. In practice, believing as he did that the heart was weak, he became the first to employ rest systematically in treatment. He held that certain mountainous regions were immune from tuberculosis. A sanatorium should be built at the lowest place in a valley, so that all walks could be so constructed that the return to the sanatorium would be down-grade. The object of this was to avoid straining the heart. He constructed about seven kilometers of gently graded paths. At every twenty steps a bench was placed and the patients were continually reminded to rest on one of these benches before they were tired. He was a doughty champion of his views, and his book is filled with quotations from opponents of his theories and his answers. He failed to describe his methods in detail or to present his results. He apparently died an embittered man before his achievements were recognized. Today he is hailed everywhere as the father of the sanatorium treatment.

Dettweiler, who was Brehmer's patient and later assistant, established a sanatorium at a lower altitude. He rejected his master's theories, and for this, Brehmer never forgave him. Dettweiler believed that fresh air cured the disease. He invented a reclining chair and built covered porches, the so-called "Liegehallen", where his patients spent a specified number of hours daily in comfortable chairs in the fresh air. He knew that patients were often injured by exercise. To obtain fresh air without the exertion of walking, he devised the rest treatment in the recumbent position. Even in his last paper published in 1902, however, he vigorously upheld the view that it was fresh air and not rest that cured the disease. He probably advocated more rest than Brehmer, and this explains his more favorable results. In 1886, Dettweiler published a detailed report of seventy-two cases of consumption that had been well for from three to nine years. Unfortunately this was not published in a medical journal but issued as a pamphlet, apparently for private distribution. As a result, doubtless, its influence on medical opinion was slight.

The first advocate of rest as a curative measure was not Dettweiler, as generally stated, but Trudeau. No one, so far as I know, has previously given him this credit, which, it seems to me, is his due. I base this statement on the following quotation from a paper he read in 1900, before the Association of American Physicians: "I think, however, the favorable influence of rest on the course of a tuberculous process is not generally recognized. Surgery has taught us that activity of a part affected with tuberculosis always tends to aggravate the disease and to render it progressive. A tuberculous joint may often be cured by simple immobilization, while it will go on to destruction if the patient be allowed to use it at will. In advanced tuberculous ulceration of the larynx, where it becomes necessary to perform tracheotomy, the rest afforded to the parts by the operation is at once followed by a remarkable improvement in the disease of the larynx. Murphy's proposed treatment, which consists in putting the diseased lung completely at rest by introducing nitrogen gas into the pleural cavity, is another proof of the recognition by the surgeon of the value of absolute rest."

For the sake of accuracy it should be stated that Trudeau, although he believed in the curative value of rest, said, in closing the discussion of this paper, that rest "is necessary only when there is temperature and the degree of rest should be guided by the symptoms". If correctly quoted, this marked no advance in rest treatment over Brehmer's method, as he kept patients with fever in bed.

As I have stated, Brehmer believed in the exercise treatment as a curative measure and Dettweiler did not. In an article Trudeau published in German, he said that he was a follower of Brehmer. I thought he meant, thereby, that he believed in exercise. Consequently, in an article on rest treatment written in 1911, I placed Trudeau's name among the advocates of exercise. The truth was he followed Brehmer as the leader in sanatorium treatment, but not in his theory regarding exercise. Dr. Trudeau read my paper and wrote me a note of protest. After saying it was pretty tough to see his name placarded as a believer in exercise, he went on to state his credo as follows: "I was one of the first, if I remember, to advocate the rest cure, and for many years had to stand my share of abuse about it. I remember distinctly getting up in medical meetings and being sat upon on all sides by the gentlemen who said 'rest was very well, but how was the consumptive to keep up his appetite unless he exercised?' Then my own men here did not believe in it at first, and it took some time for them to accept the fact that the best way to treat a tuberculous process which shows any degree of activity is by rest. At any rate, I want you to know that I have always been thoroughly in favor of rest, and that even now I find myself standing out against the new doctrine of curing people by exercise. I cannot help but feel that although, of course, there are cases that are much benefited, especially by graded exercise, the fact still remains that when a tuberculous process shows any degree of activity, rest is the safest plan to follow. I know I have hurt nobody by rest, but I am quite sure I often have by allowing them to exercise. Perhaps this was due to want of caution on my part, but I should say, as I always have, when in doubt it is safer to rest your

patient, and I know in this you will agree with me."

Dr. V. Y. Bowditch founded, in 1891, a sanatorium for working girls at Sharon, Mass. Up to that time it was generally held that this New England climate was unfavorable to recovery. This was a pioneer enterprise and its success furnished such an important object lesson that the Commonwealth of Massachusetts established this sanatorium at Rutland in 1898. It was the first state sanatorium in this country, and is today a living testimony to the faith and vision of Dr. Bowditch. He believed that life in the open air was the essential remedy in tuberculosis. This probably explains why he did not attempt, at Sharon or at Rutland, to carry out the methods employed by Brehmer or Dettweiler. So far as I know, he never did accept the rest treatment. In 1911, he said, in discussing a paper I presented at the Montreal meeting of the American Climatological Association, "His [Pratt's] ideas for keeping the patient wholly at rest are entirely against what most of us now feel are essential in the treatment, namely a mixture of physical work and rest." It was hard for him to believe, he went on to say, that patients would do as well in the dusty smoky atmosphere of a city as in the purer air of the country. This statement showed the emphasis he placed on fresh air in treatment.

It would be appropriate to erect here memorial tablets to the three men mentioned whose labors made possible this institution as we find it today: Brehmer, the father of the sanatorium treatment and the first to treat the disease successfully. Trudeau, the discoverer of the curative value of rest; and Bowditch, the founder of the first sanatorium in New England, and the inspirer of the state sanatorium movement.

It seems strange that the builders of this institution and of other early American sanatoriums did not follow the teachings of Brehmer and Dettweiler, the men who discovered how the disease should be treated in order for cure to result. The truth is that in the minds of most sanatorium physicians, the essence of treatment was life in the open air under medical supervision. For years, drugs, such as creosote, and cod liver oil, and later climatic treatment had been the chief reliance. The next step in advance was the out-of-door life in any climate but at as high an altitude as convenient. These views governed those that built the Rutland Sanatorium. The town has the highest altitude of any east of the Berkshires. No attention was paid to Brehmer's instructions. He said the sanatorium should be at the bottom of a valley. This was built on the top of a hill. Dettweiler insisted on the importance of halls or porches open on one side, provided with comfortable reclining chairs. There were no halls at Rutland and no comfortable chaise-longues. At Saranac the rest treatment in chairs was extensively used when I first visited the sanatorium in 1905.

My interest in the treatment of tuberculosis was aroused by a chance visit to Asheville in December, 1904. There I became acquainted with the work of Dr. Charles L. Minor, who was demonstrating that the sanatorium methods of Dettweiler could be employed with success in private practice. Inspired by his enthusiasm, I decided to attempt a similar work in the homes of the poor in Boston. In July, 1905, I organized the first tuberculosis class. Weekly meetings were held. Much rest was employed from the outset. All patients were provided with reclining chairs, and other facilities for leading an out-of-door life, from funds given by Emmanuel Church.

At the start I enlisted, as a tuberculosis worker, a trained nurse with experience in working among the poor, Miss Isabel Strong, to aid and instruct the patients. I called her position that of "friendly visitor". We did not have hospital social workers in those days. In fact, her work was instrumental in starting organized hospital social service. Dr. Richard C. Cabot was much impressed, that summer, with what we were doing for consumptives. That fall, in October, he started his social service department, to do, as he said, for the sick of other diseases, what we were doing for consumptives.

Here is Miss Strong's first report on the social aspects of her work. As the first of the long series of case reports by hospital social service workers, it is interesting, but I present it particularly to show that we had difficulties and discouragements from the outset:

July 8, 1905.

"Dear Doctor:

I cannot find any association which will help the Leavinson man, he cannot stay where he is, and after long search, I have found a tenement with a roof and a little piazza for $15.00. He says he could drink more milk but he is out of the Diet Kitchen line. It is barely possible that the Hebrew Ladies of the North End may help him, 109 Salem Street.

M. E. was visited by Miss Burgess of the M. S. for R. & C. this morning. She gave her a card for Parker Hill [day-camp] for tomorrow. I told her she could not go. I find she went to church yesterday, which I told her was disobedience. Mr. L. will not use the carbolic mouth wash as it causes vomiting. He is only out-of-doors in the afternoon. Shall I go ahead about the tenement? I sent out two chairs and asked to have the bill sent you. The District Nurses say all T. B. should be reported to them, and I believe Miss Stark is going to call upon you. Minnie broke her thermometer Saturday. Dr. Harrington of the Board says all the milk is good and all the oil if the dealers say so.

And my last crushing blow is that the Leavinson man would like to go to Rutland. I wish I might have seen you. I do not know whether my flag is flying or not."

M. E., mentioned in this letter, was our first patient. She recovered completely and became the efficient visitor of the Arlington Street Church Class from its organization, in 1907, until her sudden death from cerebral hemorrhage during a weekly meeting of her class in 1922. At the autopsy, a shrunken emphysematous right upper lobe was the only evidence of her old tuberculosis.

Our second patient is still living and well, twenty-five years after his return to work. At the present time there is no organization in Boston to furnish a tuberculosis worker to do what Miss Strong did for the Leavinson man twenty-five years ago.

For seventeen years we continued the class, giving aid and treatment to all consumptives that were referred to us, provided they would play the game by following the rest treatment in the open air. I never fully realized at the time the great influence of our class meetings in giving new patients courage and hope. Many of them never could have been induced to follow the strict rest treatment if they had not seen with their own eyes others who had regained their health by doing it. That the class as conducted by us was a valuable means of applying psychotherapy effectively, I discovered a year ago, when I organized a class for victims of anxiety neuroses at the Boston Dispensary. I used similar methods to those previously employed at the class meetings for tuberculosis. The testimony of those who had recovered, gave courage, faith, and self-confidence to newcomers who were discouraged and almost hopeless.

I first advocated a long period of bedrest in afebrile active tuberculosis, with statistical evidence in support of my views, at a meeting of the National Tuberculosis Association in 1907. During the next ten years, I presented in a series of papers additional evidence of its value. I gained no supporters for my views,—at least no one who publicly endorsed my new plan of treatment—until 1917. In that year, at a meeting of the medical section of the A. M. A. in New York, I read a paper with the title, "Bed-Rest in the Treatment of Pulmonary Tuberculosis." The discussion showed that the value of rest was beginning to be appreciated. Dunn, of Asheville, stated that he found himself giving a prolonged bedrest period to his early as well as to his late cases as the outgrowth of his experiences. He believed, however, that this should be followed by a "work cure" as a "hardening process". Zueblein of Cincinnati, and Pottenger of Monrovia, California, also endorsed the value of rest. Dr. Knopf, one of the pioneers in the tuberculosis campaign, insisted that the good results I presented were not due to the rest treatment. He made the surprising statement that "if we place at the disposal of city physicians all the money needed for prolonged treatment and at the same time relieve the patient from anxiety about his family, I believe the results will equal those presented by Dr. Pratt in his statistics."

At the same meeting, Dr. Fishberg, author of a well-known textbook on tuberculosis, said, "Most tuberculous patients can, and should, work. Rest is indicated in some cases, but many can work, and it is our duty to direct them along these lines." This statement was made in 1917, only fourteen years ago, by a man who was a specialist in tuberculosis.

I remember well that my paper at the New York meeting apparently made little impression on the audience. It seemed to me that the figures I presented based on ten years' work, spoke convincingly in favor of the treatment employed, but apparently it left my hearers unmoved. During this period, I had treated, in the Emmanuel Church Tuberculosis Class, one hundred and ninety-one patients. Eighty-eight of those admitted in the first stage, sixty-two per cent. of the second stage cases, and twenty per cent. of the third were well and working one to ten years after their discharge. The editor of the *Journal of the American Medical Association* thought little of my paper and, although read at a meeting of the Association, declined to publish it in the *Journal*.

The statistics given in this paper did arouse some interest when published. Dr. Kinghorn of Saranac reprinted my tables and chart in a paper read before the American Climatological Association in Boston the following year. He made a comparison of my results obtained by the bedrest method with the figures of the Brompton Hospital Sanatorium in England, where graduated exercise was used, and those obtained by the ordinary treatment of rest and exercise as employed at the Adirondack Cottage Sanitarium and at the Laurentian Sanitarium in Canada. My figures, he said, illustrated the great value of rest treatment over graduated labor. According to him, they also demonstrated another very important fact, namely that patients who undergo prolonged and intensive rest treatment do not tend to relapse.

The discussion of Kinghorn's paper in 1918 showed that the tide had turned and that the rest treatment was overwhelming the exercise idea formerly so firmly entrenched. Eight speakers, including Drs. Dunn, L. Brown, and Parfitt, rose to endorse the bedrest treatment. The only ones to oppose the rest idea were three of my Boston colleagues.

Later Clive Riviere, an English authority, printed my results in the *Lancet* and the *British Medical Journal* and after showing their superiority to those obtained in two of the lead-

ing English sanatoriums urged the adoption of the prolonged bedrest treatment in Great Britain.

Dr. Emerson has told me it was the evidence presented in my paper that led him to introduce the bedrest treatment here at Rutland. This was done about 1919. The fact that Rutland had become one of the leaders in using the prolonged bedrest treatment was indicated by a study I made about ten years ago. I sent a letter of inquiry to the medical directors of nine sanatoriums. The chief question asked was somewhat as follows: "How long would you keep in bed a patient with pulmonary tuberculosis who presents the following features on admission? No fever, pulse slightly accelerated or normal, no loss of strength, but a few pounds underweight, slight cough with positive sputum, dullness and râles at the top of one lung."

The length of bedrest treatment that would have been followed in these institutions is shown in the following table:

LENGTH OF BEDREST TREATMENT IN AN EARLY CASE OF PULMONARY TUBERCULOSIS

1. X County Hospital, Mass.—1 day.
2. Lakeville State Sanatorium, Mass.—2 weeks.
3. Chicago Fresh Air Hospital, Ill.—2 weeks; possibly 4 weeks.
4. Barnstable County Infirmary, Mass.—3 weeks.
5. North Reading Sanatorium, Mass.—4 weeks.
6. Glendale County Sanatorium, Minn.—6 weeks.
7. Trudeau Sanatorium, N. Y.—6 weeks; probably 8 weeks.
8. Westfield State Sanatorium, Mass.—8 weeks.
9. Rutland State Sanatorium, Mass.—16 weeks.

It was a great satisfaction to find that Rutland headed this list. A study of my statistics showed that sixteen weeks was about the average amount of strict bedrest we gave our patients in the class.

Years ago, when the fresh-air treatment, with little regard to rest or exercise, was the method employed at Rutland, the end results of treatment, as I have shown in earlier papers, were unsatisfactory. I am confident that the end results obtained here on favorable cases, during the past ten years, will be found to compare favorably with those of any similar institution in the world.

A further development was made by Webb in 1916. It is called postural rest and consists of having the patient rest on the affected side many hours daily.

The present position that rest holds as the chief remedy in the cure of tuberculosis is partly due to the evidence furnished by radiologists, and the success of putting the diseased lung at rest by means of artificial pneumothorax, evulsion of the phrenic nerve, and by thoracoplasty. Within the past fifteen years it has been shown by x-rays of the lungs that, under bedrest treatment, extensive tuberculous infiltrations may clear up.

The story of artificial pneumothorax treatment in this country is interesting. This valuable method was first used by Forlanini, who published the details in 1894. John B. Murphy of Chicago discovered it apparently independently and reported cases in 1898. His assistant, Lemke, carried on the work until his death a few years later. I saw one of his patients who had had a few injections of nitrogen into his pleural cavities. He was taking exercise until tired and his condition was not good. In 1900, H. P. Loomis read before the Climatological Association a paper on his personal observations. In the discussion, Babcock, Stubbert and Minor reported they had seen benefit from its employment. After that time, for some reason, this valuable method ceased to be used in this country. Brauer, in Germany, learned of the treatment from Murphy's publications, he has told me, not from Forlanini. He wrote Murphy asking why he had abandoned its use. In reply, Murphy said it was a method to be used by physicians, not surgeons.

After reading Brauer's paper, in which he reported the successful employment of artificial pneumothorax, and that of Adolf Schmidt, I determined to try the treatment and interested Dr. Samuel Robinson in this venture. In January, 1909, he injected nitrogen into the pleural cavity of one of my class patients. As this was probably the first case treated after the end of the Murphy period, in this country, I am reporting it, at the suggestion of Dr. Lawrason Brown. No manometer was used.

Julia B., aged 35 on admission to tuberculosis class, May 8, 1907. Onset with cough in December, 1905. There was involvement of the left upper lobe with physical signs indicating the presence of a large cavity. Fever on admission. Tubercle bacilli present. Gaffky Scale, 5. Under treatment the patient gained 29 lbs. in weight. When it was decided to use artificial pneumothorax, she had a slightly elevated temperature at night and her cough was almost incessant. She was raising a cupful of sputum in twenty-four hours, and a few days previously had coughed up a little blood. There were a few fine râles over the right front, but none over the right back. Over the left upper lobe in front there was marked dulness. There was loud amphoric breathing over the left front with numerous fine and medium-sized metallic râles. There were some râles over the left lower lobe in front and scattered râles over the left back.

January 24, 1909, Dr. Robinson introduced about 800 cc. of nitrogen gas into the left pleural cavity. A medium-sized trocar was inserted into the eighth or ninth interspace between the posterior axillary and scapular lines. Cocaine was used. The patient was lying on the right side. The gas was introduced without difficulty for a period of about ten minutes. No coughing or other symptoms were produced. After withdrawal of the needle, the heart was found pushed over to the right. There was tympany over the entire left side and breath sounds and râles had disappeared. One-quarter grain of morphine was given.

February 3, 1919. Cough and expectoration had not diminished since the production of pneumo-

thorax. A small needle was inserted in the tenth left interspace, scapular line, and 800 cc. of nitrogen gas introduced. Only slight discomfort resulted. The pulse and respirations were accelerated.

February 24, 1909. No change in general condition. Fever less. No diminution in cough or amount of expectoration. Yesterday 1200 cc. of nitrogen were introduced without discomfort. No dyspnea after the operation. About an hour later the patient was seized with severe pain in the chest, which soon became agonizing; at times she rolled on the floor in pain. There was a sense of "contraction" in the chest. Cough dry; every effort painful. Morphine, given in the evening, afforded some relief but the patient was unable to sleep.

February 25, 1909. Pain less but still severe. In the afternoon no pain. The patient felt comfortable and had no fever.

She suffered so much from pain after the third injection that she refused to continue the treatment. A radiogram taken a little later showed a long narrow adhesion attaching the upper lobe of the partly compressed lung to the chest wall. As I thought I had few suitable cases, I turned over the employment of this method to Dr. Robinson and Dr. Floyd, who began its use in September, 1909. Their paper published in 1911 gave a great impetus to this form of rest treatment in America.

I am confident that the use of artificial pneumothorax in early open tuberculosis should be much extended, as its tends to shorten the necessary period of enforced bedrest.

Thoracoplasty appealed to me as a promising method of treatment when artificial pneumothorax could not be used. I think I had the first or second case in the United States. I took the patient to Montreal and the operation was performed by Dr. Archibald in 1914. It was his second case. The disease was not checked by the operation in my first three cases; in fact two patients died within the first week. These failures were due, not to any fault of the surgeons, but to the fact that the disease was too far advanced when I advised the operation. Dr. Archibald again operated on my fourth case. Life was prolonged. The patient died four years later as a result of failure of the right side of the heart. The autopsy showed that the collapsed lung was completely healed. Three large cavities had disappeared. My fifth case was operated on successfully by Dr. Churchill.

A superficial view of the situation might lead one to conclude that we are handling the tuberculosis problem quite satisfactorily in Massachusetts, but such a conclusion would be far from the truth. Rutland Sanatorium has only 361 beds and it is now the only state sanatorium for adults suffering from pulmonary tuberculosis. Fifteen years ago, we had four state sanatoriums, but three are now diverted from this work to the care of children only, or to extrapulmonary tuberculosis. Even at the present time most of the cases that enter Rutland are in an advanced stage of the disease and have not been given rest treatment prior to admission. On June 12, 1931, there were fifty men and thirty-six women on the waiting list for Rutland. This means a delay of from two to three months after application has been made before sanatorium treatment can be begun. During this time advance of the disease may convert a curable case into an incurable one. Precious time is being lost. Something should be done at once to remedy this condition. The solution of the problem is efficient home treatment from the day the diagnosis is made until the day the patient enters the sanatorium. The essential part of the treatment is to put the patient to bed in a sunny, well-ventilated room, or better yet, on a porch, and keep him there. That is the plain duty of the attending doctor. It will shorten the stay in the sanatorium and increase the chances of recovery. Bedrest is what he gets here; bedrest is what he should have before he comes. Coöperation on the part of the doctors who refer cases is necessary, and this it should be possible to secure when knowledge of rest treatment is more widely spread through the medical profession. An organized effort will speed that day.

For educational work among physicians and patients there is now available an admirable pamphlet entitled, "What you should know about tuberculosis", written by Dr. Gerald B. Webb, an eminent authority on this disease, and one of the first to adopt the strict rest treatment. This handbook is published by the National Tuberculosis Association, and distributed without charge by our Massachusetts Tuberculosis League. It can be read with great profit by all of us,—physicians and laymen. A copy may be had without cost by sending your address to the League at 1149 Little Building, Boston. If every doctor who treats tuberculosis and every patient with the disease read this booklet and was guided by its advice, I feel sure we could cut the death rate from tuberculosis almost in half within a year or two.

I have no fear that the young doctors now being trained in our medical schools will not rest their patients, as most of them study Cecil's textbook of medicine and Webb's excellent instructions on the rest treatment contained therein will be read and applied in practice. How true it is that the radical advanced views held by a few of one generation, when true and verifiable, become the orthodox teachings of the next! For the truth is mighty and must prevail.

THE ART AND HUMAN NATURE*

BY STEWART R. ROBERTS, M.D.†

IT is written of an ancient King named Asa, that "in the thirty-ninth year of his reign his feet became diseased; the disease was very painful, and Asa had recourse to his physicians, not to the Eternal. Asa slept with his fathers, dying in the forty-first year of his reign. He was buried in a tomb of his own, which he had cut out for himself in David's burg, and was laid in a resting place filled with fragrant perfumes and all kinds of spices prepared by the perfumers' art; a large bonfire was lit in his honor". "He had recourse to his physicians and slept with his fathers," is, in itself, a rather abrupt intimation of clinical failure. The King was dead, long live the King. To cure a King would have been a notable cure, sure to be noised abroad, and to cause much rejoicing. Another Jew, a young man from Nazareth, "he healed them of divers diseases," and quickly became the greatest of all the general practitioners, even by the witness of his fellow physician Luke. The multitudes pressed him with patients and pursued him for cures, which were so notable that they are memorialized forever. The physician, like the tree, the field, and the laborer, is known by his fruits. Few of us can stand very much mortality. Marion Sims lost his first two patients, two babies, and went from South Carolina across Georgia to the woods of Alabama, to escape his failures.

On the rippled stone of one of your buildings is written the first real comment on the rare Art whose artists we are, and hope to be. It was sketched by a Greek mind, "keen-eyed, cold and fair," critical, pliable, stable, his senses all attuned to receive the impressions and the information the patient and his symptoms are trying to give, observing the patient again and again, studying his symptoms over and over, willing to be mentally bombarded by the shower of clinical impressions, until the patient, his sickness, his personality, and his variations, stand out with an ever-increasingly clear interpretation. Such an attitude of mind is the very essence of the scientific spirit. Century after century the first axiom has admonished each generation of students, and made plain the personal responsibility, the heavy duty, and the holy relations involved in the practice of the Art. Hippocrates must be glad to know that he still lives in his writings on a medical building at Harvard and on another medical building at Yale, the Crimson in English, the Blue in Latin, but to appear at both places would alone add to the credibility of the quotations and make them beyond peradventure true. It is the best known of all the sayings of medicine and worthy of daily acceptation,—

> Life is short
> And the art long;
> The occasion instant
> Experiment perilous
> Decision difficult.

The single life is short but the Art is long in all its ways,—in time to acquire the knowledge; in experience to acquire the skill; in the years to unmuzzle one's wisdom, to come to full sagacity, to be much famed, to test the fads, and realize the contribution of one's generation. It is even longer in periods and epochs for accents, methods, and points of view to change for a better Art. The bedside condition demands action,—the time for meditation is past. It is dangerous to take a risk unless it is necessary, there is too much at stake. Decision is difficult, there is so much of contrary evidence, and the outcome is uncertain. The clinical mind is a state of mind that would do all things well.

Medicine is more than a formula. It is a life, but its Art is only one expression of the all inclusive medicine that takes up one's life. We say that "the youngster is going in for medicine," and he really is, with his whole life. He will see, hear and think little but medicine until he dies. His medicine is a threefold whole, an attempted science, a glorious art, and a public function to society. It is an attempted science because there is so much each one of us will never know, so much it is useless to know because it is as yet unapplied, and probably as much yet to be discovered as we all know. It is an Art of practical service to sick people, and an effort to keep them from being sick. It is an ever-increasing public function of the community and the Commonwealth. The greater aim of it all is health, which is a sane wholesomeness of the person and of the personality, and something far more than just feeling well. The poet, Tennyson, wrote that nature is careful of the type and careless of the single life. The physician, Hippocrates, wrote of the single life, its pains and its needs, to which our Art devotes itself. Nature handles life *en masse;* the Art, one by one. Commodities are by wholesale, in the years of plenty up, in lean years down, as now. But the Art is from one to another, a personal service from person to person, a value related to human contact. The school teacher was given a position in the ticket office with increase in salary. She suffered the hu-

*One of a series of lectures on "The Care of the Patient," delivered before the Harvard Medical School on Wednesday, October 28, 1931.

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man ache for a year, and then went back to the grammar grade and the lower salary, with the explanation that she had worked so long with folks, she could not work with things. Kipling sang of the sins we do by two and two and pay for one by one. Science that we gain by two and two the Art uses one by one. The manifold relations of the Art abound with personal pronouns expressive of the personal contacts and the personalities,—"my Doctor," "my patient," "my method," "my treatment," "my operation," and the utterly worn and frayed, "I had a case."

The Art is to human nature what common sense is to all other sense. The Art covers up its knowledge with art, that through human nature it may serve the personality. "It is the height of art to conceal art"; it is the heart of art to serve artfully. Common sense covers up all other sense with sense that it may serve its purpose. David Harum, that adroit American, and far more typical than Main Street, closes the book with an exclamation of wonder, joy and wisdom as necessary to the clinician as to the novelist,—"Scat my cats! Human nature is human nature, only more so." And voices from a more dignified and academic atmosphere tell the same story. The young minister had finished his first sermon and was walking home with an old friend of his father. He was very happy and confided in the older man, —"Yes, I was born here, and finished High School here, and then to the University and then to the Seminary. I have studied French and German, Hebrew and Greek, read much, tried to prepare myself, and now I have the old church back home." The older companion listened and after awhile said,—"Yes, John, all that is fine. I am proud of you. And if your father were living, he would be very proud, too. But John, what do you know about folks?" One gets something from many and plain people that one gets in no other way. A medical student or young doctor can do nothing better than to spend some months with a good general practitioner out in the open spaces where the roads are long and the stars are pinned high, and one can touch and go with the suffering, the woe, the patient courage, and the humor of the race. A crepitant râle or a tinkling pneumothorax has always seemed to me to tell clearer tales in the lonely resourcefulness of a country home than in the muffled walls of a steam-heated building.

When we think of personality and human nature we tend to sidestep and do some clinical fumbling. So long as we stay well within the limits of a corporeal and scientific knowledge all seems well. We glibly remember and use mercurochrome, and salyrgan, phenobarbital and digitalis; we do this operation and that, as the condition demands, but when our Art is tempted to the investigation of an entangling alliance with some human problem, a conversation perhaps on which the peace and release of the patient may depend, well, it is so much easier to write a prescription, do an operation or send the patient to a hospital. Just so artless and unthinking people want work by a timeclock and daily task by pigeonhole assignment that they may not be bothered by the duties, relations and responsibilities of the job. The mere tasks of the Art considered theoretically appear easy, but when related, analyzed, thought out and meditated upon in terms of a personality, the quality of being a person, and of human nature, the ever-colored quality of being human, the hues and tints change.

The Art alone is like a lovely extra fare train, screened, curtained, carpeted and velveted; it has the right of the road and its passengers have tickets and seats. The train is the Artist, and the passengers are the armamentaria and the accomplishments of the Art. All goes well so long as the train stays on the track; so long as the Artist considers only the Art. But let the train run into an open switch and be derailed at a siding, and the sleeping cars mix with the lowly boxcars, and the picture changes. Let sickness and accident come, trauma and tragedy with the limitations, reactions and imperfections of human nature, the Artist is at practice with human nature and its personalities. Each boxcar is a unit with a tag, a name and an abbreviation all its own. The siding is the place where the local business of the road is really done. The boxcar may be freshly painted and new, or worn and dulled with work, and suffer many quick pulls and jerks from time to time. The rain falls on it, the doors may be left open and the wind blow through it, the sun may peel off its paint, icicles may hang from it in winter, it is packed and made to creak with many burdens, it stays long days at one place and then rolls away to other places, but it carries things, and does the work of the road, fills the treasury and asks only to be taken as it is. It is the way of all flesh. It is Human Nature as the Artist finds it.

One of the first surprises that came to me in practice was the revolution in the content of my work. I knew one had to see the patient with as much promptness and persuasiveness as is proper, but I thought the practice of medicine consisted of a good history and a careful physical examination, then such laboratory studies as seemed indicated for the plain view and the often rather elastic conclusion called a diagnosis. There seemed so much more to a physical examination than had appeared. It really was a good part of the Art to do one well. It was so easy to omit an organ or neglect an area. One rich young man in New Orleans went to many places seeking a cure because he

was always feeling badly. He was examined, rayed and tested so many times. There was so much examination and so little treatment, and his feelings were the same. They threw his complaint in a big basket labeled neurosis. Finally he went to a young doctor in New Orleans, a plain human pal and friend. The young doctor wondered what he could do since all the older doctors had done nothing. "I can at least examine you. Come in and strip." On the sole of the left foot was an anesthetic area of scaling, harmless looking papules called leprosy. I learned about medicine from him.

My plan was to devote my life to history taking, examinations, laboratory work, conclusions and appropriate treatment. And they actually told me that treatment was easy if one could make the diagnosis, and I believed them, so simple and credulous was I. Then I began to find out things about this life called the practice of medicine. For every hour I spent in history taking and examinations, I spent two hours in conversation and explanation, in changing technical medical language over into simple good English that described the complaint and condition of my patients, in answering the few questions I could and in parrying the thrusts of those other questions as gently as I could, that neither I nor any other man could ever answer. When I was sure and could answer clearly, everybody seemed satisfied, but when I was doubtful and fell to "iffing", "butting" and "anding", they seemed very much dissatisfied. They seemed to think that a doctor had all medicine in his mind ready for any question anywhere at anytime from every Mr. Interrogation Tom, Dick and Harry alive, much less Mrs. Question Mark Smith, Jones and Johnson who often appeared to me to lie awake nights thinking up things to ask about. I had many questions about doubtful points to ask myself, and in my books and journals could find sometimes fairly good answers, but not always. And then I realized that in medical school and hospital, I had learned more science than art, and that private practice had introduced me suddenly to sick human beings who wanted to get well very quickly, and that patient, family and friends could ask many questions. Then it dawned upon me that they asked questions because they were anxious about a very dear member of the family or a friend who was sick, and in their love and anxiety they sent flowers, paid visits, stayed around the hospital, waited and strained for the result of the operation, the grown-ups came home when the old folks were sick, and there were many other yearning ways of real men and women when kindred blood and heart were ill. I soon saw that my Art and Human Nature had best meet and get acquainted and be friendly and understand each other, for we needed each other that the Art might serve and survive in each clinician. About this time I met a wise old clinician named Perspective and his congenial walking companion whom he called Proportion, and I determined to cultivate them. They seemed to see things I needed much to see.

This Human Nature, while very gentle and solicitous, had some very definite ideas. It was sometimes unreasonably anxious, but it also reasoned very clearly along well-drawn lines. It might not say much but it could look a great deal and very straight. In general, it wanted the truth though it often feared it, and intensely wanted to shield the patient from the truth if it were unfavorable. The diagnosis was often called the verdict, and an operation, particularly among the less educated, who seemed to care with a terrible devotion for their family, was a picture of danger and blood with much subsequent suffering. The anesthetic seemed a greater dread than the knife. When affairs went badly with the patient, the family sometimes saw the change before I did. It was difficult for me to tell just how sick a really sick person was. First of all, they wanted to know what was the matter, often before I even had a good history or had finished the physical, much less had time to think. A lawyer has to gather together his legal evidence, but with some people a doctor is the evidence. Was it serious and would he get over it? I often wondered when I really knew what I thought I knew. The patient's condition at times was like a bulb that one had planted the previous autumn. Spring was here and the first shoots were green above ground, but the name had been forgotten. As soon as the flower came, we could tell its name and all about it. I learned to wait until nature unfolded the case after I had done all I could to hurry the unfolding along. Great old nature was my best friend, and the patient's, too. I found that my Art had a meeting house called Experience, which I had hitherto not attended with sufficient regularity. And then the discovery came that the result of my experience is Experience, and the result of my art is Art, but that both Experience and Art are the slow yielding gifts of the years, and the years give very grudgingly. I saw again that the Art is long.

One thing I learned that stood me in good stead. When the patient just dragged on, even if nothing more could be done, a consultation was in order and best at my suggestion. Each consultation was a brief postgraduate course without fee or travel. The Consultant was always a lesson, even if sometimes it strained me to see as he did. He was older and came the full-groomed artist in his prime. He was easy and cheerful and even the family seemed to feel his power. He chatted quickly though not hurriedly, "passed the time of day" as Uncle Re-

mus used to say, then listened to me, then entered the sick-room slowly, all eye, ear and impression ready, did much with gentle touches here and there, radiated faith, hope and courage and some fight, and was through, except talking to me and the family. Afterward the family looked reassured even though the outlook was clouded, and asked fewer questions. It then appeared that what was best for the patient was best for everybody, for the purpose of the Art is the care of the patient. Human nature is still human nature. I noticed that ever afterward the Consultant noticed me, and was more cordial and kindly. I then found that "I was called in consultation" is one of the pleasing conceits of medicine.

I had to watch my tongue. It functioned more easily than my mind. I had to learn not always to talk about what I was talking about. I learned too, that when a patient or his family were irritated, he and they were not always mad about what he thought he was mad about. On such occasions the less I said, the more quickly the unpleasantness was over and the better they liked me, later. Woe came to me when I did my thinking aloud. It would not do to say that it might be this and it might be that. The patient was entitled to my conclusions, not to my psychic mechanisms. A timid, trembling little woman came one day, the sister of a woman in another doctor's care; she was frightened because "he said it might be tuberculosis or cancer or blood poisoning; he didn't know, he could not tell yet". This is clinical thinking with a loud voice and out of time and place. Toil we must, think we can, talents we may have if the gods favor us, but tact we must have always and everywhere, with just a little of being gentle, easy and sympathetic. Doubt is upsetting and worry is its offspring. Be a good listener and do "the Coolidge". No man ever made very many clinical mistakes by keeping his clinical mouth under cautious control. Patients have a way of remembering what the doctor said long after he has forgotten it.

The questions continued: "how long will he be sick? How long will he be in the hospital? When can he sit up?" And that restless question of the hospital patient, "When can I go home?" Never, "when may I go?" The military patient seems ever ready to remain in the hospital and the civilian patient ever ready to leave. Why all the hurry? Human nature does not relish being sick unless one follows the profession of a hypochondriac and luxuriates in it as an advertising asset. I had heard of prognosis but not of prophecy in medicine. And here there was daily demand that I prophesy the length of time of illness, its seriousness, time of recovery. Hippocrates, how long, was the cry! To my dismay I found that all the prophets were dead, really dead. Great old Isaiah and far briefer and minor Habakkuk, not a prophet left either to comfort me or to lift the clinical veil. I had not been interested in prophecy and here it was daily demanded and there was no prophet. Sometimes the Art seemed as helpless as it was long, except that certain clear signposts began to emerge in the distance. And it seemed wise never to argue with a signpost. It could not talk back and it might be right. One signpost intimated strongly that the clinician should live in an atmosphere of truth and an environment of fact, tell tactfully the situation when necessary, but avoid being a firebell of clinical alarm on the one hand, or so professionally callous on the other as not to recognize pathologic trends or the coming of emergencies. No clinician need ever be ashamed of the truth. He can, however, be thrifty with it and not tell it all any one day to any one patient. Another signpost hinted that the future is uncertain, full of surprises often, and that when we attempt to prophesy we should begin by saying "So far as human judgment goes", or "We can only judge the future by the past," or "My experience has been." The past only is certain; the present we may not be able to interpret and the future has not arrived. Another signpost suggested that the main thing was to do the day's work with a dignity inspired by a new virtue called Poise, which confers upon the clinician an immunity to hurry and jerkiness, including a dietary chorea at the table, to jumping either to conclusions or to remedy too quickly, and to a realization of such character values as faith and peace and a wise optimism. In golf one *should* look down, but in life one *must* look up. It is just as easy to top the ball in medicine as it is in golf. Poise immunizes me to fear, worry, bridge building, backward looking, accenting my mistakes, becoming impatient with a patient, expecting far too much of my juniors and aids, and gives me right to a clinical prayer which proposes no yesterday and no tomorrow, no surprises and no disappointments, no regrets and no preferences,—just the work of today. Only as the Sage of Sagamore Hill said, "When I play, I play hard, and when I work, I play not at all."

There was such an increasing demand for prophecy that I could but look for more signposts. The patient and family continued to ask "What will it cost? or "What is the expense?" And I found that my Art had a very emphatic economic quality that had not been impressed upon me either in medical school or hospital. No one seemed much interested in economics but my parents and the hospital superintendent until it appeared that human nature was as much interested in costs as in Art. The Art shied from it, and did not seem easy when the

question was raised, and would wait another day. I wondered why someone had not taught and trained me a little in this problem of the multiple costs of my Art. The signpost said, "Talk it over. Be fair." It was curt, cryptic and cold as business matters are. Just here Socrates interrupted,—"Is the physician, taken in that strict sense of which you are speaking, a healer of the sick or a maker of money? And remember that I am speaking of the true physician." And Stevenson added,—"Generosity he has, such as is possible to those who practice an Art, never to those who drive a trade." The shorn lambs are the heritage of the Art and the duty human nature gives it. Lambs, unshorn, receive special care. But somewhere this quality called justice arises between the service of the Art and the served, between the laborer and his hire. It has not yet revealed whether the golden age of medicine is past or not. Some of us have felt recently that the silver age might also be gone. Sheep herded together and leaping over old fences into new pastures bring changing conditions and new problems. Consider every sheep with reasonable regard to his economic status, the value of the services rendered, the time consumed and the results obtained. Sometimes wolves appear in sheep's clothing, and want much for nothing, and get it. And then the Artist must needs swallow a bitter tonic of experience called injustice in a vehicle called imposition. But he learns gradually to take both gracefully and to treat "those two impostors just the same". He may be tempted to ask the age-old question,—"Is it Art?" and then old friends Perspective and Proportion whisper, that in the long run, nothing is to be gained by controversy. In any event, the patient is to be cared for.

Human nature rarely seeks a physician unless it needs him, or sincerely thinks it needs him. The tendency is to postpone him as long as possible. On account of such delays, the illness that at first might have been taken in hand and cured easily, may have developed into an imperative emergency. On the other hand, it may have developed an identity that permits a precipitately correct diagnosis. It is too common for a patient to be very sick and not to know it. Hence the prudence of regular physical examinations, otherwise care may be neglected. Unusual and startling symptoms may bring the patient quickly to the doctor. When he comes, he thinks he ought to come, either for pain or fear or added safety or some particular symptom. To be sure he may belittle his feelings, exaggerate them, or even imagine them, but he needs help. A good illustration is that of the old fellows in the clutch of Anno Domini, who enter with their delightful courtesy, excuse their coming on the insistence of the family, explain their complaint as due to some trivial breeze or heavy eating, and then with much conversational pleasure, kodak their varied symptoms. One such charming *raconteur* described himself beautifully and when he had finished said,—"Well, Sir, what do you think of all that?" His physician replied, "Really, I enjoyed your diction so much I forgot what you said." The patient laughed heartily and said, "Ah, Sir, such a compliment to an old man is Caviar to the King."

There can be much gained by the personal human touch with each patient. Here is indeed the artist's opportunity. Here is the open door for a happy clinical rapport. Personalities are all different and require a different approach. Patients fortunately do not at first know what we know, or if we know, but they do glimpse our personalities and what we say and do. In clinical company the patient usually recognizes "His Master's Voice." The human touch of the clinical artist in the sick-room is usually proportionate to the human experience of the artist outside the sick-room. There is much more in life than medicine, and the more of life one can add to his medicine, the more wisdom and understanding he will have. Mercy, faith and service are the beginnings of every clinical friendship between physician and patient. The sick mind and the clinical mind do well to find a common ground for mutual dependence. The shrewd, kindly lawyer sent a young doctor to see one of his lowly clients and after directing him to the house, said, "Knock lightly, walk in slowly, listen well 'til he first gets through, and then practice medicine down on his level." Osler, in company with an interne more thorough than tactful, met a new patient of uncertain age, one of those who masks his years. The interne asked quickly, "How old is he, Dr. Osler?" The saving reply came just as quickly, "About as old as we are." The pediatrician said if his north-side patients knew what huts he visited on the south-side, and his south-side patients knew what palaces he visited on the north-side, neither might let him enter. But he knew that, like Judy O'Grady and the Colonel's Lady, all babies under their skin are kin. He knew too, that the new-born baby is a mere body, a man in miniature, but with care and time it gradually unfolds into individuality and expands into personality.

So far we have been sailing close to shore in sailing vessels and launches neat and trim. And how conventional we doctors are and how we lay hold of the ways and ideas known and accepted of the Art. Always hungry for the new facts of science, fearing lest we may not keep up for the mutual advantage of self and patient, we wait with patience the bursting of the bonds that will silhouette the sick person in ever clearer light. And should we venture beyond the harbor's mouth beyond the medicine

that would traditionally view the patient as a mere body, and the Art minister merely to protoplasm and its morbid variations, we run far out on an ocean whose name is personality and whose surveys are far from complete. There are many pathologies, gross, cellular, functional, and personal. There is a personality pathology or its beginning of high or low degree in nearly every patient. A patient with a growth called carcinoma has a gross and cellular pathology, an upset too of local function, and the management of this cancer patient becomes ultimately a problem in personality. Science here is lacking, the Art alone can care for the patient, comfort and soften the ultimate blow. No charming personality incarnating the Art can itself master the patient, or suffice for service. Science without Art is but a mass of facts. Art without Science is but manners and empty words. The more Science for the Art, the greater the Art and the more efficient the care of the patient. As the young man perfects his Art, he must continually add to his Science. The medical fathers need daily to orient themselves anew on the medical meat upon which their young Caesars feed that they have grown so great. I am not uneasy of the training and knowledge our students receive in terms of their increasing ability to give the patient his full meed of care, provided only they remain students with the yearning for learning. There is no place for a clinical weakling in the medicine of today or tomorrow. It is all for the patient but it takes more for the patient all the time. The force of the clinician's personality and his will to work, the hunting instinct aroused and after game, the diagnostic detective after clues whose collective proof clamps the conclusion, the mind with the urge of problems and the weighing of evidence, the planning and execution of the operation, the guiding of the obstetric head, the interpretation of the infant's cry, the unwrithing of the tangle of the emotions and the instincts, the understanding of the individual, the effort of preventive medicine to make a safe place of the whole world, the trial for a sane therapeutics and management, and the thousand details, naggings, interruptions, interjections, imperfections, expostulations and imprecations, these require all the strength of strong men. And the ringing of the telephone which reminds one more and more of Macbeth's wail,—

> "Tomorrow, and tomorrow, and tomorrow,
> Creeps in this petty pace from day to day."

The truth of the matter is that we have never agreed upon the unit of our Art. The family is the unit of society, the dollar of trade, the acre of land, and the yard of cloth. Why not a unit for the Art, which has served and slaved the length of Human Nature. With a unit the bigness of the task is plain, and one can tell whether any of it may be neglected. Signs are increasing that the unit of both Art and Human Nature is the personality, which commonly we call the patient. A full medicine is capable of a full task. An Art which aims at the wholesomeness of the individual is long since past a mere body medicine and is rather an inclusive medicine of body, mind, spirit, emotions, instincts, their relations, conflicts and expressions. We cannot separate one from another in the individual anyhow. There is not one medicine of the body and another of the mind and yet another of the soul, but there is one great medicine of the Personality. Human nature recognized this long ago and was bolder than the Art, for it conceived of the doctor as an institution of the family, the caretaker of all its woes and the soothsayer of its spirit. One of my associates had just finished taking a history and as he passed he stopped me and pointing his finger to the word "nervousness" said, "I wish you would write a paper on that subject. Half the patients who come here have this same complaint and have nothing the matter with their bodies that will account for the complaint." A mother asked her doctor, "When babies smile in their sleep, are they supposed to be dreaming? And if they are, of what are they dreaming?" When personalities come complaining and their bodies are whole, of what are they complaining? And even if their bodies are not whole, a member here offending and an eye to be plucked, how much more is their suffering become a sore on their soul, and a bending of the will to such weakness that it cannot will. "Every age has people, servants, and conquerors; the only supreme good fortune of mankind is a great personality." To the Art, however, there is no respect of personalities save their varying needs and care.

The personality has virtues, rhythms and obliquities all its own. There is one fibrillation of the auricles and another fibrillation of the personality. There is need for some undiscovered galvanometer to record the waves of the personality. Each personality is as distinct and different as the human voice, and is entitled to individual recognition. Years ago Cannon presented his "Bodily Changes in Pain, Hunger, Fear and Rage," and to these four enemies of the peace of the personality one may add worry, hurry, strain, struggle, weariness, jealousy, hate, loss, grief, disappointment, sometimes just living, and the body as well as the personality must change. How very simple and lifelike is Alvarez' book on "Nervous Indigestion." A large proportion of our heart personalities come not with heart disease but its fear. I am sure life crowds us as we grow older. With less youth and more age, there are more problems on every hand. Great lives are apt to be quiet lives; hurried lives are worried lives. A man of sixty goes to his physician. What did he

bring? A great deal more than a body born sixty years ago. True it has had sixty years of wear, work, intake and output, a few infections and has been immunized to a few diseases. It may have lost a few teeth, its tonsils, an appendix or a gallbladder. Even now there may be a plot against its prostate. There is evidence that he might have died either with an acute appendicitis at thirty-three or a pneumonia at forty, but for the care of a good surgeon and a good clinician. He has had to work hard, run a business and rear a family. Some of the old folks too he looked after until they died. He has had a lot of trouble and done a lot of things he had rather not think of. He realizes that to feel another's trouble, one must first know trouble himself. Sin may have been deflated and lost its standing, but his sins seem to have attacks of palpitation at three in the morning. His children have caused him much happiness and great anxiety. He is realizing that life is a curious, big thing, not easily understood. Now he is not so well, nothing much the matter, just not so well. He has noticed an occasional early morning headache and a rare stabbing breast pain when he worries much or is very tired, and he thought he would just drop around and see the doctor, just drop around.

For the Artist to care for Human Nature, he must first care for his own nature. More than any other man, he is many things to many men, and women and children too, but only one man to himself. Life is short but he is its alpha and omega, the first alive to the new-born baby's eye, the last when the old ones die. He has some part in all the intimate relations of human life; he runs with the years, and the years, they just fly by. The prizes go not always to him who climbs the fastest or has the better mind, but to the patience endured of many patients, the lesson learned of many lives. Let him read and interview many distant minds; he will see Shakespeare in his patients and his patients in Shakespeare, and the Proverbs of Solomon illustrate their wisdom and folly. With easy grace and in uncanny ways he serves his generation, only with himself let him be rigid and unrelenting for the sake of his health, his work, his character, his ability, and his disposition. It is the combination of qualities and not the greater gift, that paves the broader and farther way. More than half of him is muscle, only a little by mass and weight is brain; to exercise the one and to rest and nourish the other makes for the longer life. If he would be healthy, let him exemplify health. If he would promote preventive medicine in his community, let him live it. A Nero in the evening makes a poor Hippocrates the next morning. He is always a doctor, and is so judged by his patients and would-be patients. Whatsoever he finds to do, let him do it with all his might now, avoiding as a pestilence that most chronic and persuasive inflammation affecting his kind, procrastinitis. Of character he needs all he can live up to. He can keep his soul in a hovel whose walls are kalsomined with expediency and whose few doors are temptation, or in a rich temple furnished with many a soothing antique and the things that are more excellent. Let him make a fortress for his soul of some kind, for pain and adversity are his daily companions, and his drugs but the beginning of a therapeutics to which his character contributes much.

Aristophanes wondered,—

> "Are life and sorrow kinsmen? Surely sorrow
> Is wealth's attendant, fame's familiar,
> And walks with poverty the path of age."

His cheerful disposition should be the happy contrast between sunshine and a cloudy day. His humor is indispensable at the right time and may save the day when all else fails. His easy temper and smooth temperament is an asset soon noised abroad. His inexorable courage adds optimism to courage and helps him care yet hides his care in a friendly way. One of President von Hindenburg's associates noted day after day the amazing and placid nervous system of the old General, and asked,

"What do you do when you are nervous?"

"I whistle."

"But I have never heard you whistle."

"I never whistle."

MORTALITY RATES

Telegraphic returns from 82 cities with a total population of thirty-six million for the week ending December 26, indicate a mortality rate of 10.7 as against a rate of 12.1 for the corresponding week of last year. The highest rate (19.1) appears for Nashville, Tenn., and the lowest (3.8) for Flint, Mich. The highest infant mortality rate (11.7) appears for Memphis, Tenn., and the lowest for Louisville, Ky., New Haven, Conn., San Diego, Calif., Schenectady, N. Y., Spokane, Wash., Tacoma, Wash., and Waterbury, Conn., which reported no infant mortality.

The annual rate for 82 cities is 11.7 for the fifty-two weeks of 1931, as against a rate of 11.9 for the corresponding weeks of 1930.

CONQUERING DIPHTHERIA

A county health officer of Maryland reported to his State department of health that not a single classmate of a child who attended school for a week while suffering from a mild unrecognized attack of diphtheria had shown, to the date of his report, any sign of the disease, though a mild case of diphtheria is known to be as contagious as a severe case. Practically all the children, however, had previously received immunization treatments, and the department of health in a recent bulletin expressed the opinion that the district had thus been saved from an old-fashioned epidemic of this dread disease.—*U. S. Children's Bureau, Washington, D. C.*

MEDICAL PROGRESS

PROGRESS IN OBSTETRICS

BY JOHN ROCK, M.D.*

PROGRESS IN OBSTETRICS

EACH year the voluminous current literature marks progress in obstetrics. A well-done bit of work by a rare man here or there, or the presentation of accurate observations made over a period of years by a sagacious clinician, shows that pregnancy has been made more comfortable, or safer, and that we have approached a little nearer to the goal of making labor a pastime, when no accident or disturbance can occur which will even incommode mother or child. An attempt is made here, not to present a synopsis of obstetric literature, but rather to present to those practicing, but not specializing in obstetrics, certain practical improvements of which they may as yet be unaware. Little of theory will be included. Other subjects might be discussed, but space forbids. Another year's practice will make such discussions more valuable.

ANTEPARTUM

Prevention of Pregnancy. Obstetrics is that department of medicine which has oversight of the function of reproduction in women. Its responsibilities are not merely the actual delivery of the parturient mother and the care of her and her baby during the immediate postpartum period; it must also protect the mother and baby during pregnancy. Most clear thinking and unprejudiced medical men expect obstetrics to do even more than this. It must, they believe, protect women from their unwilling exercise of the function of reproduction during any time that pregnancy promises to ruin their health or reason or endanger their lives. To such questions of the effect of pregnancy on health, or life, or reason, the medical man by his training is qualified, and by his licensure legally justified to give the answer if there is one, and if treatment is indicated, to teach or to execute such treatment. By no stretch of the imagination, however, does the specific training of the physician or his licensure by the state qualify him to protect from pregnancy those patients who think that their economic or their social status would suffer from it. Only when life, health, or reason is seriously endangered can the obstetrician apply his science,—and then, unprejudiced physicians agree, he must.

Human experience incontrovertibly teaches that continence is an absolute safeguard against pregnancy; but because of the carnal nature of man and the lack of mental discipline from which at least one member of most couples suffers, it has not proved an adequate or harmless method from the physician's point of view. The mechanical methods, the condom, the wire or stem pessary, as well as the various vaginal tampons or cervical caps have not been certain enough to serve their purpose and are all subject to objections for psychologic or more serious pathologic reasons. So too the spermatocidal medicaments which have hitherto been in general use are, like the mechanical appliances, too often disease provoking or uncertain,—usually both. Withdrawal is dangerous, unpleasant, and notoriously uncertain.

An excellent exposition of the historical as well as the newer and fairly satisfactory methods of artificial prevention of pregnancy is made by Dr. Antoinette Konikow[1] of Boston in her "Physicians' Manual of Birth Control." For one without sympathy for what he considers the ill-advised and even pernicious teachings of the so-called leagues for so-called birth-control, the book contains much that will be distressing. For the honest sincere obstetrician seeking for means to prevent pregnancy in a patient who, by means of it, will suffer serious impairment or destruction of health or reason, and to whom continence is for the time being irremediably uncertain or dangerous, this book, in spite of its gross faults, can be useful. It describes in detail the best modern methods of prevention, together with the proper technic of their use. The older methods which serve as the basis for all the nonsense that is currently preached about the physical harmfulness of methods of prevention are now supplanted, and thoroughly harmless ones can be used. If these methods are, as they seem to be, as inoffensive, as certain, and as simple as she describes them, progress has been made in obstetrics. Sterilization will be less frequently necessary. The number of therapeutic abortions will be reduced. Unfortunately, the new methods will be prostituted by the wicked and the selfish, but that is no reason why doctors charged with the protection of the life, health, and reason of women should not know them and in carefully selected cases prescribe them. These cases will decrease as medicine progresses, but to deny that there are many such now is to demonstrate ignorance of midwifery, or outright dishonesty. To recognize such cases and, after informing the patient of the fact, blindly to prescribe continence, or refuse to treat them according to sound medical principles is quite another matter, and may

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bespeak in the physician merely a deviation of allegiance to another profession than that which concerns us here—medicine. In a so-called Christian world many honest men will find justification for this. It is wrong, in such cases, however, for the doctor to make believe that he is practicing medicine.

Time of Ovulation. Many who object to the use of artificial methods of pregnancy prevention, and who yet cannot be blind to the obvious impossibility in a given case of complete continence, have preached that coitus is safe, that is, unproductive, during certain definable days in each menstrual cycle. The time of ovulation is important also in that more pleasant aspect of the physician's work, the relief and not the establishment, of sterility. Obstetrics is aided much in this problem by the endocrinological laboratories. Papanicolaou[2] of Cornell says that most gynecologists place ovulation between the thirteenth and the nineteenth day after onset of menstruation, roughly the third week of the menstrual cycle, but he also says of human females that "the highest point of fertility has been shown at the eighth day after the onset of menstruation which is actually the day when the copulation period begins". If this be true the second as well as the third week of the cycle must be considered as included in the time of ovulation. Ogino[3] agrees with this, placing the period of conception from the ninth to the sixteenth day after the onset of menstruation. He says that pregnancy is seldom possible between the fourth and the eighth days of the cycle, and impossible (sic!) from the seventeenth day on. Wittenbeck[4] of the Halle Frauenklinik denies that physiologic sterility exists after the seventeenth day; and in discussing his intensive study DeLee[5] authoritatively says: "There seems to be no doubt that a woman may conceive at any time between periods. Cases of pregnancy beginning at any time are on record in great numbers. . . ." This is not new—but it is appropriately reiterated from time to time, that good obstetrics may not slip backwards under pressure of misinformed persons who preach that the time factor can be used to ameliorate the hardships of continence which they consider the only justifiable method of preventing pregnancy. For each individual woman there is undoubtedly a comparatively "safe" period in each month, when no follicle is ripe enough to rupture, or when the ovum has been free so long that it no longer is susceptible to fertilization. Such periods can be accurately diagnosed in animals by careful biologic determination of the varying amounts of folliculin in the blood and urine and in some cases by readings of serial vaginal smears. When such methods have been perfected for application to women, and when a woman at frequent intervals each month is tested, it may be possible to tell her what days in that particular month coitus is unlikely to be followed by conception. Until such time as that, it is unethical for anyone to tell any woman that she can safely consider herself infertile at any time in any month. On the other hand, for those who are concerned with the treatment of sterility, it may be said that the most likely time for most women to become pregnant is from the ninth to the nineteenth day of the menstrual cycle.

Diagnosis of Pregnancy. Last year we mentioned the Aschheim-Zondek test for pregnancy. This has gloriously proved itself, and to its authors is due great tribute from obstetrics. Innumerable laboratories in this country and in Europe have reported their trials, and all agree that it is at least 95% dependable, even as early as seven days after the day menstruation was expected but failed to appear. For each urine to be tested at least three immature female white mice, 21 days old, are used and sacrificed. The urine is injected under the skin in amounts varying with each animal over a period of sometimes two, sometimes three (Aschheim proposed two) days. One hundred hours after the first injection the ovaries are examined. If there are corpora lutea or corpora hemorrhagica in the ovaries, luteinizing hormone or Prolan B must have been present in the urine injected. Such is found in the urine only of women who harbor functioning products of conception—a living fetus, a mole, or chorioepithelioma. As the fact of pregnancy is usually the question asked, this test is handsomely adequate. It is, however, expensive. It requires patience—several days being necessary for the test; and a huge colony of mice if there is always to be a sufficiency of immature animals.

An improvement of the test, utilizing the same principles, has been proposed. Mature female rabbits instead of mice are used and not necessarily sacrificed, as readings can be made without ablation of the ovaries. The method is attributed to Friedman[6] of the University of Pennsylvania who first described the effect of the luteinizing hormone in urine from pregnant women on the ovaries of the rabbit. Magath and Randall[7] from the Mayo Clinic, report their experience with Friedman's test applied in eighty-five cases. They conclude it is "both practical and accurate. It is of great value in distinguishing either early or late pregnancy from other conditions". Because such bioassay of the urine is now of established worth as a test for pregnancy I quote their comment at length: "Although this test is simple to perform, certain precautions are necessary. In the first place, the first urine passed in the morning should be used and should be injected within an hour, or the specimen should be kept on ice until it is used. Urine older than five hours probably should not be used. If the urine is

cloudy it should be filtered. Rabbits younger than two and a half months should not be used, and we have found no objection to using old animals if they have not recently copulated. It is absolutely essential that rabbits be kept under such conditions as to insure their not being pregnant as well as not having recently copulated. If the rabbits are young, care will have to be exercised to be sure females and not males are selected for the test, for the external genitalia are not so clearly recognized as in older animals. We prefer to isolate animals in single cases for three weeks before using them, thus avoiding any of these difficulties.

"Sterile technic is not necessary, and from 7 to 15 c.c. of urine should be injected slowly into the marginal ear vein of the rabbit. Thirty hours should elapse before the animals are examined, else the test may be indefinite. Positive tests are indicated by the presence of corpora lutea and corpora hemorrhagica which are detected by gross inspection. If they are not clearly evident, the test had best be considered negative. In our series of positive animals, marked injection of the uterus and oviducts was striking."

There will be other modifications of the original test. Eberson and Silverberg[8] of the University of California propose separating the luteinizing hormone on which the test depends from the follicle-producing hormone which may confuse the picture, and describe a method of doing this, as well as concentrating the luteinizing hormone so that smaller volumes of higher potency and lower toxicity may be given. This lowers the intercurrent mortality in the test animals and evokes more prompt and extensive response from the ovaries. They report 100% accuracy even before amenorrhoea appears, and as early as two days after the test is begun. A micro-colorimetric method is probably not far off.

The clinical value of this diagnostic aid is obvious. Every doctor to whom the question of pregnancy may be presented should now have contact with a laboratory where this simple test can be accurately and promptly made. A voided specimen, preferably of morning urine, containing no preservative, is all that is required from the patient. This can often be mailed to the laboratory and a report received in not more than five days. Again abstruse research on laboratory animals proves its tremendous practical value to the clinical practitioner. The test is the result of a study of the estrous cycle in rats, successfully carried on in spite of the anti-vivisection societies who by this new blessing are again invited to cease and desist.

This wide avenue of endocrinologic approach to the problems of parturition has merely been entered. Studies on the quantitative changes in the anterior pituitary secretions, Prolan A, and Prolan B, on the ovarian secretions, folliculin and progestin, and on the related substances from the placenta and decidua, and the mutual relationships between them and the hormones from the thyroid and the adrenals, and the pancreas as well as the posterior pituitary and the other glands of internal secretion are all under way. How many of the problems of sterility, contraception, abortion, premature labor, early and late toxemia, premature delivery, dystocia, etc., will they solve? A glorious era is ahead!

Küstner[33] of Leipzig suggests another method of determining the presence of a living ovum in the enlarged uterus. If 0.5 c.c. of pituitrin be injected intravenously, he says, and the uterus be pregnant, it will become hard and remain so for 3 minutes; if it be not pregnant, and the confusing enlargement due, perhaps, to a fibroid, the organ will remain soft. One at first would fear the effect of such a contraction on the fetus, or even that it might produce abortion. Küstner says not, and is probably right. Pituitrin to which the uterus is so very sensitive at term has remarkably little effect on an early pregnancy as many who have tried to induce therapeutic abortion with it will testify. Gellhorn[34] of St. Louis is apprehensive, and would use the test only in an emergency such as during laparotomy when an immediate differential diagnosis must be accurately made. It would seem to be very useful then.

INTRAPARTUM

Relief of Pain. Because it is now possible to relieve the parturient of most if not all of the distress of actual labor and delivery, the conscientious accoucheur must accept responsibility for this, as well as for the safety of mother and child. The problem he must solve will vary with many factors; but the solution he will find in the combined action of many drugs. Besides an appreciation of the pure obstetric problem of ushering the fetus into separate existence in the world he is justly expected to have knowledge of these comforting drugs with their indications, actions, and limitations; adequate equipment, and facilities to use them and sufficient acquaintance with the patient and the qualities of her labor. The analgesic agent used, its quantity and the time and frequency of its exhibition will vary with the individual labor. There will be no routine method. The interval and the intensity of the pains, modified by the nervous sensitiveness and the mental reaction of the patient to the pain as she feels it, and the probable duration of labor are all important factors, giving precedence in the attendant's mind only to the effectiveness of the uterine contractions to deliver the fetus safely and without injury to the mother, which re-

mains his prime concern. Proper analgesia must not make delivery more difficult or more dangerous; it will eventually facilitate it. To this goal we strive and for this purpose we try to give close and enlightened attention to the individual woman in labor.

Chloroform, ether, and nitrous-oxide are old standbys with well-known disadvantages. Ether by rectum has no merit to the normal patient over the inhaled gas, save economy in attendance, and has some demerits. In passing one might also suggest, anent the Gwathmey method of analgesia, that pituitrin in tiny doses of one-half or one minim is superior to quinine as an oxytocic. But why use ether when it has such a depressing effect on uterine contractions as to require an opposing stimulant? Ethylene is too dangerous. Its obvious advantages are not sufficient to justify its use in the face of its lethal explosiveness. Scopolamine is an excellent hypnotic: it will not relieve the pain of labor. It is very well supplemented by morphia or pantopon, the use of which, however, is rigorously limited by their evil effect on the baby's respiratory centre, and with some patients by their inhibiting effect on uterine contractions. Such a combination is not satisfactory in rapid or very severe labors. Novocaine and its close relatives are excellent adjuncts to other agents when used for sacral or local anesthesia. More will be said of this later. Their only disadvantage is that, by removing the stimulus to expulsion which the patient otherwise receives from the pelvic floor during the second stage of labor, they tend to increase operative deliveries. A better way out must be found for most cases. All of which is trite history.

Progress in analgesia is potential possibly in avertin, and surely in the derivatives of barbituric acid. To regain the family honor which many think has been innocently lost by its still hardy progenitor, avertin has triumphantly won kudos from the whole surgical world. It is tribrom-ethyl alcohol. It is a crystal, soluble in water, but so much more soluble in amylene hydrate that it is commercially supplied in a 100% solution of this, itself an hypnotic formerly used in epilepsy. The solution is colorless. It is best administered by rectum, the proper dose being mixed with water or milk as a conveyer. Great care must be taken that the mixture, which must be heated to prevent precipitation of the drug, does not exceed a temperature of 45 degrees C. Beyond this the alcohol breaks down, permitting the formation of dibrom-acetaldehyde which is corrosive to mucosa. To be quite sure that this disastrous decomposition of the alcohol has not taken place, 5 c.c. of the final mixture, just before its injection into the rectum, is tested by the addition of a few drops of 1:1000 water solution of Congo-red. If the medicine is safe it will turn orange-red: if unsafe, because of the occurrence of the dibrom-acetaldehyde, it will be blue or violet, in which case it should be thrown out. The temperature of the mixture must be carefully kept between 35 and 40 degrees C, and even then the simple test should invariably be applied.

Avertin has hitherto found its widest application in general surgery, but reports of its use in obstetrics are rapidly accumulating. We need not make the mistakes the surgeons did, but rather should we wisely profit by their experiences. Lundy[9] of the Mayo Clinic writes that it "should be employed generally as a basic anesthetic only; that is, as one which must be supplemented by another agent". As contraindications he lists advanced hepatic and renal disease, pulmonary tuberculosis with cavitation, bronchiectasis, colitis, and diabetes. White and Kreiselman[10], of Washington, D. C., add extreme cachexia and acidosis to the list. They conclude, from their experience with it in surgery that it is an almost ideal anesthetic. With Lundy they warn that "when used alone for deep anesthesia, its use is attended with danger"; but they believe that "when used as a basic anesthetic, it is probably one of the safest agents for anesthesia". They suggest gas or novocaine as excellent adjuncts.

Reed[11], of Chicago, reports on the use of avertin in 10 obstetric cases. In three cases the contractions were retarded, but not seriously. This is one of the disadvantages of its use during labor, though possibly not a disqualifying one if care is taken to keep the dosage low. It has been thought by some that the babies were stupified. Reed writes that all of his babies (except a macerated fetus) "cried lustily as soon as delivered". Avertin he finds offers no danger during the third stage. Reed, however, withheld this proposed agent until "dilatation was practically complete". If it is not proper to use it much earlier than this it will not meet the full demands of obstetrics.

The surgical dose is from 100 to 150 mgm. per kilo of body weight. The dose during labor had better be not more than one-half of this, for atony and cessation of labor are too likely to occur otherwise. (The dangers of pituitrin as a counter-stimulant, given before full dilatation, need not be reiterated here: they are adequate to exclude the availability of pituitrin from being an argument in favor of the use of avertin.) If avertin usually requires an antidote, it will not do.

Avertin's ease of administration and low toxicity, its high coefficient of analgesia and amnesia, make it attractive to the obstetrician. For use during labor, however, it is still an experimental drug, and should be used timorously on carefully selected patients and only in well and copiously staffed and equipped hospi-

tals. Its use for surgical obstetrics can be freer, because general surgery has already done most of the pioneer work and profited by the chastening punishments for its incorrect use. Obstetricians can share in this profit.

As complete but safer obstetric relief is offered by that branch of the prolific veronal family marketed as amytal. "Amytal (Eli Lilly & Company) is ethyl-*iso*-amyl barbituric acid, which differs from the parent substance (*di*-ethylbarbituric acid) in that one of the ethyl groups of the latter is replaced by an *iso*-amyl group. The monosodium salt of this acid has been placed on the market under the name of Sodium Amytal[12]; and herein lies relief to the woman in labor. It is obtainable as a white crystalline powder in capsules containing 3 grains for use by mouth. It was formerly supplied for experimental purposes in sterile ampules for use intravenously, but probably because of the greater danger from too rapid administration this preparation has been discontinued. Nembutal, an isomer of sodium amytal, and having the same action is still supplied in sterile ampules by Abbott Laboratories. Each ampule contains seven and one-half grains. The injection is made in a 10% solution. Because of the easy absorption of sodium amytal and its isomer we must keep in mind Lundy's[9] caution, "that the effect of a barbituric is not essentially related to the method of its administration but rather to the dose. Nevertheless when given intravenously it is wise to use only 75% of the dose which would be given by mouth, and that 75% must be given very slowly.

Robbins et al[13] of Indianapolis suggest 1/6 grain per kilo for amnesia, and as much even as 1/3 grain per kilo for surgical anesthesia. Massey[14] of Dallas gives about 1/5 grain per kilo. At the Boston Lying-in Hospital[17] the standard initial dose is the smaller one, for there it is customary to give 9 grains by mouth to the ordinary patient weighing about 130 pounds, which is roughly 1/6 grain per kilo. Lundy[9], a man of extensive experience whereby to perfect his technic, with the requirements of general surgery in mind, prefers to give the drug intravenously if the dose exceeds 10 grains, because exact requirements are thus more easily gauged. During active labor in the normal patient, when the nervous system is receiving such constant and severe stimuli as come from uterine contractions, the danger from a moderate overdose is too small to necessitate even such a slight involvement of technic, and the drug may safely and more easily be given by mouth. If the stomach will not retain it, the capsules may be given by rectum, though probably a strong solution of their contents would be more readily absorbed. In eclampsia, of which we shall say more later, it is perhaps better to give it by vein if at all.

Sodium amytal alone may not meet all the requirements of labor and delivery. To obtain these might necessitate doses too large to be constantly safe. When given for surgical anesthesia it often causes a fall in blood pressure, quite undesirable in the ordinary puerpera who is bound to lose some blood in the third stage. It may also depress the respiratory centre, and in large doses might similarly affect the fetus. Using an initial dose of 15 grains, Hamblen and Hamblin[15] of the University of Virginia, obtained complete amnesia in two-thirds of the cases. Most of the patients received separated doses—the total amount, in some cases, exceeding 25 grains with an average total dose in 33 patients of more than 20 grains. It was all given by mouth, and, with standardization in mind, no other narcotic was used. They make ten statements in their summary of a detailed description of their experiment. That comparison may be made with others' conclusions from similar observations, I quote them, though I write their last comment, first.

"10. "As this work is based on only fifty cases, further work is necessary to establish the proper dosages, method of administration, the desirability of combinations with other drugs, and finally, to evaluate its worth in the relief of the pains of labor.

1. "Oral administration of sodium amytal in labor is probably just as satisfactory as by the intravenous route.
2. "The difference of only a few minutes in rapidity of action when given orally as compared with the intravenous administration is not sufficient to influence its effect in labor, except in the most stormy labors.
3. "The depth of narcosis depends rather on the dose employed than on the method of administration.
4. "Labor has apparently not been prolonged, nor have operative deliveries increased. No postpartum hemorrhages have occurred.
5. "No untoward effect on the baby has been noted.
6. "Marked variations in susceptibilities occur and there may be definite idiosyncrasies. For this reason the patient should be carefully watched during the period of narcosis, and blood pressure readings taken regularly.
7. "Complete amnesia and a moderate amount of analgesia can be obtained in the vast majority of cases. The anesthesia cannot be relied upon.
8. "The initial dose probably must be as large as fifteen grains and a total of thirty grains during labor may be administered with comparative safety.
9. "Restlessness is probably the greatest drawback to the use of sodium amytal in labor and apparently occurs in the majority of cases. Our experience is that this is no more marked when administration is oral than when the intravenous route is chosen."

Robbins and his associates[13] considered that "the best procedure in the average 125 pound woman was: 1/8 to 1/6 grain of morphia, 1/150

to 1/200 grain of scopolamine and of intramuscular amytal 0.390 to 0.585 grams (6-9 gr.) when contractions were regular and were occurring at less than ten-minute intervals. The injection of sodium amytal was repeated as indicated. An intravenous injection was usually given at the beginning of the second stage in amounts from 0.390 to 0.650 grams (6-10 gr.). It was administered slowly during several pains, stopping when the patient was well controlled''. As a preliminary report of their study of more than 100 cases they ''feel justified in drawing the following conclusions'', some of them almost identical with those quoted above:

"1. "The most serious objection to the use of sodium amytal as an analgesic was the difficulty in controlling the patients who became very restless.
2. "The drug has the advantage of being rapid in its action and of having a wide range of safe dosage.
3. "There has been no evidence of harm to the mother.
4. "Labor is probably not delayed.
5. "Labor may be rendered practically painless.
6. "Obstetric operative procedures are much more easily carried out under ordinary anesthetics when the operation is preceded by sodium amytal.
7. "Danger to the baby has not been proved.
8. "Prompt and complete control of eclamptic convulsions is possible.
9. "As a general anesthetic agent for Caesarean sections and other obstetric operations and especially for patients having tuberculosis or toxemia of pregnancy, sodium amytal bids fair to supplant the inhalation anesthetics."

At the Boston Lying-in Hospital a position midway between the two already mentioned in the use of sodium amytal has been taken*, and the excellent results obtained have led many to apply the same treatment in private practice. To patients of normal weight 9 grains of the drug in capsules are given by mouth as soon as labor is definitely under way, i.e., when effacement has begun and contractions are recurring regularly at at least ten-minute intervals. Not later than one-half hour after this 1/100 grain of scopolamine is given subcutaneously. The room is darkened, cotton is placed in the patient's ears, a blind is tied over her eyes, and everything possible is done to diminish external stimuli. Constant nursing attendance is instituted, as the patients are usually moderately irrational and restless during contractions. No attempt is made to restrain them except gentle assistance in keeping them on the bed, or the equally commodious delivery table. They are vocally aroused when water need be given by mouth or the bedpan used. Coöperation is usually adequate. An additional dose of 3 or 6 grains of sodium amytal and of 1/150 grain of scopolamine are given if labor is prolonged more than three hours and the patient's mental condition demands it. When the expulsive part of the second stage is reached, nitrous-oxide and oxygen with even a little ether if necessary are given in the usual way and preparations made for delivery.

Results are indeed gratifying. If the proper amounts of these three drugs, sodium amytal, scopolamine, and nitrous-oxide are given labor is not prolonged and is more likely to end in normal delivery, the patient may be expected to remain sufficiently quiet to make careful delivery easy, to sleep at least through the uncomfortable hour and a half following delivery, and to awake with no memory of events subsequent to the initial medication, and the baby to behave as if no medication were used. Nelson has noted no appreciable fall in blood pressure, no tendency to hemorrhage, no evil respiratory or cardiac effects, as was said, no injury to babies, and a diminution in the amount of inhalation anesthetics required. Like the others who have been quoted, Nelson finds the patient's restlessness the major disadvantage—surely a minor one, merely requiring nursing attendance. Reminiscently, cannot this be properly termed ''anesthesia au goût de la reine''?

Of the barbituric acid derivatives sodium amytal is not the only one which has enjoyed recent popularity for use during labor. Nembutal mentioned above is the name under which the Abbott Laboratories market an isomer of sodium amytal, which Eli Lilly and Company, the makers of sodium amytal sell as Sodium-*iso*-Amytal. It is similar in chemistry and action to sodium amytal[12]. Pernocton, sold by Riedel de Haen, Inc., and in this country called Pernoston, is a 10% solution of the sodium salt of secondary butyl-*B*-bromallyl barbituric acid. Naturally enough all the detailed reports of the use of this drug during labor have come so far from German clinics, for this is a German drug elaborated under the inspiration of Bumm[37] of Berlin who first used it successfully in surgery. It was sponsored then by Vogt[38] of Tübingen who applied it to obstetrics. Bumm's dosage was 7-8 mgm. of the dry crystals per kilo of body weight, or 1 c.c. of the 10% solution per 12½ kilograms. This is the standard dose used by all who have published their results. They all give it slowly into a vein. E. Vogt[18] ''has seen the drug used in approximately 1000 cases and estimates that altogether about 20,000 to 25,000 labors have been conducted with Pernocton. He believes that this is the ideal drug in obstetrics because it diminishes the sensation of pain and it produces amnesia without injury to mother or child''. Hole[19] of Würzburg, is not

*The work was done under the direction of Dr. F. C. Irving by Dr. H. B. Nelson, the resident obstetrician. A preliminary report has already been accepted for publication in the *American Journal of Obstetrics and Gynecology*. I am indebted to the author for permission to quote from his notes.

so enthusiastic, though he considers it to be usually an efficient and rapid analgesic. If the dose is too large, patients become excited and labor is interrupted. If analgesia is desired for more than a short time he advises that scopolamine be used as an adjunct,—just as we have mentioned above it is so effectively combined with sodium amytal. Löfkovits[20] of Prague uses Pernocton with morphia and magnesium sulphate, but considers it even then too dangerous for general use. Putz[21] of Miskolc, in Hungary, describes his great satisfaction with Pernocton, much as Nelson, above, did his with sodium amytal and scopolamine. He offers as contraindications, obesity, weakness, anemia, prematurity, primary atony of the uterus, placenta previa, high fever, and heart disease; several of which Hole of Würzburg also warned against. Halban[22] of Vienna, using the standard dose intravenously of 1 c.c. per 12.5 kg. body weight, considers results satisfactory, though anesthesia lasted only one hour, and occasionally "wild excitement" followed the injection. Kobes[23] of Kassell does not agree with Vogt[18] and Löfkovits[20] that Pernocton is harmless to the child, though he considers it useful as an analgesic in labor. Bromine, presumably from the bromallyl radical in pernocton, was found in the urine of the fetus even 4 days after delivery. It was also detected in blood from the cord and in the amniotic fluid. He believes that the babies are drowsy from the pernocton for at least 24 hours postpartum. It would appear that pernocton offers no advantages over sodium amytal.

Because Somnifène was one of the early barbiturates used in obstetrics, from which descended Pernocton and the rest, and because it is still used on the continent and appears now and then in the literature we should at least mention it here. It is the ureide which gives Allonal (Eli Lilly & Company) its hypnotic effect, allyl-*iso*-propyl barbituric acid. As early as 1924 Riss[24] of Marseilles evinced modified enthusiasm for it. His comment, exuding as it does the vibrant quality of French "sagefemmerie" amuses us: "L'etat de la femme sous l'influence du somnifene devient veritablement impressionnant pour l'entourage et il est indispensable s'avoir autour de soi un personnel vigoureux et de sang-froid pour maintenir la parturiente et l'empecher de se blesser ou de tomber." In 1929 the Betters[25] of Haifa reported their satisfaction with it. Like the other barbiturates, when used alone, it often makes the mother difficult to manage, but it does give amnesia, and does not retard or complicate labor, or have any permanently deleterious effect on the fetus.

Hardly a trimester passes that some journal does not carry a well-written article on the so-called Gwathmey synergistic method of analgesia, now at least ten years old. As its enthusiastic godfather, who elaborated this particular combination of drugs, Gwathmey[26] outlines his final technic, thus: "1. three intramuscular injections of magnesium sulphate, each of 2 c.c. of a 50% solution; 2. an injection of morphine sulphate 1/4 grain, *given with the first injection of magnesium sulphate only;* 3. a rectal instillation of the following formula:

Quinine alkaloid	grains	20
Alcohol	mm.	40
Ether	oz.	2.5
Petrolatum liq. or olive oil, q. s. ad.	oz.	4

The method is now old, has been tried in practically all well-run obstetric clinics and by practically all conscientious specializing obstetricians, yet has not yet achieved the respect or popularity which it should have if most of the effects claimed for it were obtainable by most men or in most clinics. The reviewer believes that it can never be generally used, for various intrinsic reasons, and not because of defective technic. Ether as well as morphia is not good for mother or baby, though infinitely better than nothing; magnesium sulphate is but a mild narcotic whose synergistic effect with morphia still awaits convincing proof; quinine is a certain oxytocic of quite uncontrollable extent, evoking too often a violent reaction on the part of the uterus, which, like the action of ether and morphia, is undesirable from the fetal standpoint. Furthermore, dependence on rectal administration, which is uncertain in effect, uncomfortable, and potentially harmful, of two essential antagonists like ether and quinine, in this combination of drugs, does not inspire most men with confidence. We believe it can never become a routine or even a standard method. It can at most serve as an occasionally useful makeshift, until we find a drug or drugs which will relieve pain without interfering with the uterine contractions or the physiology of the fetus. It is a bad principle to use a drug the undesirable part of whose effect must be neutralized by another drug, itself potentially dangerous. If avertin requires pituitrin, or morphia requires lobeline or a Drinker respirator, or ether requires quinine, these drugs will not be considered the best.

Gellhorn[27] at the inauguration of the Central Association of Obstetricians and Gynecologists in his home city of St. Louis brought local anesthesia again to the attention of midwifery. He uses morphine and scopolamine during the first stage and well into the second, supplementing, when necessary with nitrous-oxide, "but this is discontinued when the head becomes visible. At this stage the perineal skin, the lower circumference of the vulva, the perineal body, and the levator muscles are infiltrated with ½ per cent. novocaine solution, with 3 drops of

adrenalin to the ounce. Two or three ounces are needed. The levators relax immediately and the introitus is seen to gape. Delivery, whether spontaneous or by forceps, is painless and episiotomies can be made and, later, repaired painlessly and bloodlessly". "Perineal tears are infrequent owing to the marked relaxation of the vaginal outlet." "The child is not affected by the small amounts of morphine and hyoscin. The third stage shows no alteration."

He mentions the disadvantage that "uterine contractions usually decrease in force as soon as the local anesthesia becomes effective, i.e., about five minutes after infiltration," and then adds, they "may be stirred up again by a few drops of pituitrin if the progress of labor is retarded". This would be a more serious indictment of the method if it occurred earlier in labor. Now, when the vertex is crowning, the outlet relaxed or episiotomy easily made and repaired, a small amount of pituitrin is a harmless adjunct. It is when increased intrauterine pressure may have to relieve itself by rupture or be withstood by a capable muscularis, while the fetus suffers, because the normal cervical opening is rigid and obstructed by a fetal pole too large to be extruded, that pituitrin is too dangerous to be advertised as relief from an artificially produced contingency. If the novocaine has not been used too early and the perineum is really relaxed, instead of using pituitrin to obtain expulsive force we may use Kristeller's method of manual pressure on the outside of the fundus, for if such conditions prevail there is little danger in it. Or if the head is very low we may express it by pressure behind the anus, by what DeLee calls the modified Ritgen's maneuver.

There are many advantages to this method which Gellhorn outlines. He gives one reason for favoring it which, were it expressed differently, would certainly call forth maledictions from the D. A. R., Kiwanis, and everything in between. "I am not sure it is wise", he says, "to eliminate by artificial means all memory of the highest function that women can fulfill." Nonsense! One is annoyingly reminded of those harping obstructionists who harassed Simpson more than eighty years ago. Furthermore, no woman is likely to forget that she had a baby merely because she was completely relieved of the agony of the second stage of labor.

Adjunctive local anesthesia has many other protagonists. Greenhill of Chicago never misses an opportunity in his comprehensive reviews to extol its merits. Torland[28] of Seattle is very enthusiastic, not believing with Gellhorn that novocaine is likely to interfere with the uterine activity; neither does Oku[29] of Kyoto. The latter does warn of the danger of infection from plural injections. His paper includes a very good diagram of the area to be anesthetized. Torland describes the anatomy and details his method: "For each case" he writes, "I always have a local anesthesia set sterilized and prepared on a special tray. This consists of a 5 c.c. Luer syringe with several needles, one very fine for the initial wheal and one or two larger for the deep injection. Besides this I have two ordinary medicine glasses, one for mixing and the other for saline, besides ampules of 2 per cent. novocaine solution with adrenalin." "It is sufficient . . . to remember the Colles' fascia which is considered the most sensitive part of the perineum, and which in reality only is the lateral extension of the hymen, and, therefore, lies on the same depth level as this structure. Under this fascia on both sides of the vagina, extending from the rectum and almost up to the symphysis pubis, is a long narrow space called the ischiorectal fossa. This space is filled with loose areolar and fatty tissue and contains the principal nerves and blood vessels supplying the perineum and vulva. This fossa can be divided into two triangles, the anterior and the posterior, by a line drawn from one tuberosity of the ischium to the other. This line will go approximately through the perineum midway between the anus and the posterior vaginal commissure. In the anterior triangle thus formed will be found the pudic nerve and branches of the hemorrhoidal and sacral nerves. It is easily understood, therefore, that by one injection each in those two triangles (bilateral, of course) the whole nerve supply of the perineum and vulva can be blocked and completely anesthetized."

"The injection is very simple. One half and one per cent. novocaine are used. The pubic arch must be palpated to be sure of landmarks. In the anterior triangle the needle is inserted 2-4 cm. above the lower margin of the vagina and 2 cm. from the rami. The needle is passed 2-4 cm. deep until the resistance of Colles' fascia is felt. This is pierced and 3-5 c.c. of a 1 per cent novocaine solution injected." "In the posterior triangle the needle is inclined laterally and inserted at a point midway between the anus and the tuberosities to a depth of 4-5 cm., and 5-10 c.c. of a 0.5 per cent solution is injected on each side." Torland cautions against accidental intravenous injection of the novocaine—adrenalin mixture. With each insertion of the needle the plunger should be slightly retracted to be sure no vessel has been entered.

We would emphasize Gellhorn's statement of when to anesthetize the perineum, namely, "when the head becomes visible". If used too early the effect may be lost by the time it is needed, or we may be confronted with the arrest due to removal of the expulsive stimuli from the pelvic floor to the voluntary abdominal muscles which are so valuable in the latter part

of the second stage. It might also be mentioned that in following the progress of the oncoming fetus, it is safer for the patient if the ardent nurse busies herself by supplying the attendant with rectal gloves, rather than by inserting her own fingers too far into the vulva to spy.

We have said nothing about anesthesia for abdominal obstetric operations. There is little progress to note, unless it be in the further proof that nitrous-oxide and a little ether are safer than ether alone or than spinal anesthesia; and that local anesthesia in the previously narcotized patient should not be attempted in cesarean section, at least, by the inexperienced; nor by anyone, unless all preparations are made beforehand for a complementary inhalation anesthetic to be used should the local fail to achieve its end.

To sum up this long chapter on the relief of pain; it would seem that in sodium amytal in moderate doses, given by mouth, early in labor, and supplemented instantly or soon after by scopolamine, plus, perhaps, in some cases, morphia or, preferably, pantopon, and supplemented in the second stage by gas oxygen and possibly a little ether,—in this combination of drugs we have the best and simplest and safest prescription to relieve the pain of labor and delivery, yet devised. It is not perfect. A better will soon be found.

COMPLICATIONS OF PREGNANCY

Hyperemesis Gravidarum. It is gratifying to note in the printed discussions of this subject during the last two years the emphasis placed on the toxic element and the almost total neglect of the formerly individualized neurotic element. Slowly but almost completely clinicians have come to realize that the neurotic element so commonly observed in patients who vomit excessively is but a manifestation of the fundamental toxic condition. Logically, then, the rationale of treatment has been modified, perhaps even more than the method, for now the patient is isolated from other patients and from relatives so that she may have peace and quiet for her irritated nerves. She is no longer scolded when she vomits, any more than the eclamptic who convulses; nor is she harassed with threats of those awful clysis needles if she will not retain her drinks. Rather is every precaution taken to comfort and quiet her, that all her energies may be focused on defense against the toxemia and not dissipated in wasteful adjustment to an unwarrantably troublesome environment. This is a very important distinction to impress on nurses and student doctors who have been brought up in the cruel ignorance of an antiquated tradition.

For several years treatment has depended on rest, quiet, denial of everything by mouth, and on intravenous glucose and saline hypodermoclysis. Cornell[30] of Chicago depends on proctoclysis by the Murphy drip method to inject into the circulation every 24 hours not less than 4000 c.c. of fluid. The volume should be noted,—a large amount is necessary. To this 4000 c.c., because he considers the toxicity to be acidotic, he adds 200 grams of glucose, 80 grams of sodium bicarbonate, and 160 grains of sodium bromide. Besides this he gives 2000 c.c. of salt solution under the skin if there is any sign of dehydration. After the first 24 hours a little bland food is given as often as every 2 hours. Presumably, if this is vomited, the routine starts all over again. Cornell also, with what must be considered merely reverent ceremony, gives corpus luteum extract;—which need not be noted.

In toxic vomiting the amount of urine excreted should be carefully checked. If in the second 24 hours following the first, during which 4000 c.c. of fluid has been taken up, less than 2000 c.c. have been excreted there is either need for more fluid intake or there is suppression of urine, which is indicative of grave toxemia. Then it is wise to give hypertonic glucose solution, perhaps 25 per cent., intravenously, and another 2000 c.c. of fluid under the skin. If during the third and fourth 24 hours there is still oliguria or tachycardia (a pulse over a hundred may be considered such) evacuation of the uterus must be seriously considered, for the patient is seriously ill and the fetus is dying or dead.

The fact that many of these patients who recover their health soon miscarry raises the question whether the treatment kills the fetus. Perhaps it does. We must not give it up until we have a better one. Is it not more likely that the toxin involved, either directly or by its disturbance of the maternal physiology, does the damage rather than the simple hyperglycemia? Hofbauer[31] of Johns Hopkins, because he considers the hepatic and renal lesions in fetal hyperemesis similar to those found in animals after experimental injection of histamin, whereby he produced abruptio placentae, believes this protein is criminally involved. He also makes the inspiring observation that if insulin is given with the histamin, no damage is done to the liver or kidney. At Johns Hopkins, though not for this reason, they profitably give insulin with the glucose for toxic vomiting. Hofbauer believes that the reason glucose is beneficial may be because it calls out large amounts of insulin which, besides caring for the glucose that evoked it, also neutralized the histamin or histaminoid toxin at the root of the disturbance.

Eclampsia. Robbins[13] and his associates are enthusiastic over the results obtained from giving sodium amytal in eclampsia. They report eight cases, two of them being postpartum

eclampsia. One patient was kept anesthetized for three days by the drug. One of the eight died, probably of toxemia plus lobar pneumonia, and another of cardiac collapse two days after delivery by cesarean section done 12 hours after the last of three quickly successive convulsions. During those twelve hours the patient was narcotized with sodium amytal. Moore[16] of Grand Forks, North Dakota, also reports the effective use of sodium amytal in three cases of severe toxemia and in one case of eclampsia.

We have had no personal experience with sodium amytal in such cases. One must remember that the toxemia of pregnancy is definitely related to defective protein metabolism or the excretion of its end products; that urea is one of these end products; that barbituric acid is urea combined with malonic acid; and that amytal is ethyl-*iso*-amyl barbituric acid—each molecule of which contains a molecule of urea. The theoretical advisability of injecting twenty or thirty grains of sodium amytal, containing perhaps ten or more grains of urea, into a toxic patient may be questioned, but the answer from clinical results should be respected. We would suggest that, before the bold therapeutist adds 600 or more mgms. of a particular protein end product, 50% of the normal content, to the blood stream of a toxic patient, he at least assure himself that there is ample eliminative power and no existing nitrogen retention. He does not mean by this warning to raise the old cry that urea retention is the cause of eclampsia, for this is doubtless untrue. He would merely have the clinician keep in mind the unexplained but constantly observed relationship between eclampsia and liver necrosis, that between hepatic functioning and urea, that between urea retention in the blood and eclampsia, as well as that between urea and sodium amytal. If the latter is to be injected into eclamptic patients it must be done only meticulously and with adequate laboratory facilities for the study of blood and urine.

Abruptio Placentae. Clinically it is not usually difficult to distinguish between the comparatively harmless partial premature separation of the low attached placenta which occurs just before demonstrable contractions of labor begin, or intrapartum, and that quite different toxic separation with apoplexy or retroplacental hemorrhage and more or less extensive extravasation of blood into the uterus and adnexa as well as into the liver, kidney, or elsewhere. In the former type the patient is not "sick" and shows signs of hemorrhage proportionate to the amount of blood discharged, usually slight. In the latter toxic type, the patient is usually very "sick", or in shock. This, the so-called "Couvelaire" type of toxic separation, has in this country for more than twenty-five years called for prompt delivery. In the early days accouchement forcé was resorted to by those who feared this outrageous procedure less than the admittedly dangerous cesarean section. As the unavoidable mortality from the shock of manual dilation added to the shock of the original condition became evident, and the technic of cesarean section was improved, the comparative safety of this method brought more and more cases to the surgical table. Another advantage was attributed to delivery by section; only thereby could one determine how badly damaged was the uterus by the extravasated blood, which in this toxic type may fill the intramuscular spaces and change the emptied organ from the normal hard pink structure into a soft, almost mushy, mottled blue or purplish one. Because we thought this organ was as defective in function as it was abnormal in appearance, abdominal delivery was advantageous, because so easily followed by hysterectomy.

In 1928 Goethals[32] of the Boston Lying-in Hospital called attention to the fatal oliguria which followed cesarean in two of the cases he reported. In the next year Bartholomew[36] of Emory University Medical School in Atlanta, after analyzing his 61 cases and the mortality statistics reported since 1920, reached this commendable conclusion: "Induction of labor, watchful expectancy, stimulative and supportive treatment, offer the best prognosis. Shock, if present, should be treated from the first and labor then induced, if pains have not begun. Cesarean section, manual dilatation of the cervix, internal version and extraction, or difficult forceps delivery are associated with an increased maternal mortality, especially in the severe cases."

Kornfeld[35] of Brooklyn examining 50 cases concludes that "the conservative treatment of abruptio placentae gives far better results than the radical methods which are still advocated by various authors today". His "conservative treatment" includes "judicious neglect," "rupture of the membranes with or without 2 to 3 minim doses of pituitrin", as well as "insertion of Voorhees bag after rupture of the membranes".

Being of the same mind, Irving, Chief of the Boston Lying-in Hospital, has there changed the standard treatment for toxic separation of the placenta from cesarean with or without hysterectomy to conservative treatment from below. The patient is treated for shock with transfusion if necessary, the membranes are ruptured, the vagina and cervix are tightly packed, and an abdominal binder, tightened by a Spanish windlass, is applied. This is exactly the treatment recommended in Jellett's Manual of Midwifery and described as the standard treatment in the Dublin Rotunda over twenty years ago. This backward turn of Bartholomew and of Irving has the earmarks of progress. How

careful we must be to avoid the fire when the discomfort of the frying pan becomes almost intolerable! Our relief from the tragedy of toxic separation of the placenta is apparently not in cesarean section, but rather in discovery of what the malign occult toxin or toxins are which give us hyperemesis, eclampsia, abruptio placentae, and nephritis. Progress in this direction is being made, but has as yet not justified any great change in clinical attitude.

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ITEMS OF HISTORICAL INTEREST RELATIVE TO PELLAGRA IN THE UNITED STATES

In connection with certain studies being conducted by the United States Public Health Service with reference to pellagra, considerable information of historical interest has recently been obtained. It appears that as early as 1864 a physician in New York and another in Massachusetts each reported a case of pellagra. Another physician in New York reported cases in 1882 and 1902. A physician of Georgia reported a case of pellagra complicating hookworm disease in 1902. In 1906 an Alabama physician was the first to report pellagra in endemic form in this country. In submitting the report at that time, this physician pointed out that there had been cases present but unrecognized in the Mount Vernon, Ala., Insane Asylum each year since 1901.

In 1912 a physician in South Carolina from a study of the clinical records of the South Carolina State Hospital for the Insane and some personal interviews and correspondence with practitioners, insane hospital authorities, and others concerned, reached the conclusion that the disease had been continuously present in South Carolina at least since 1828. He also presented information indicating that the same may be said of many other sections of the South. Few of the older American textbooks on medical subjects mention pellagra.

It is not contended that this disease was so prevalent prior to 1907 as it was found to be during the years immediately following. In view of certain inevitable dietary readjustments resulting from shifting economic conditions which are now looked upon as the dominating factors in the epidemiology of the disease, there might easily have been, and it is probable there was an increase in incidence following the economic depression which began in 1907.

THE WIDESPREAD INCIDENCE OF SMALLPOX

The U. S. P. H. Service reports that smallpox is widespread and during the calendar year 1930 there were cases of the disease reported from nearly all of the countries of the world, although most of the countries of western Europe reported comparatively few cases. In 1930 England and Wales reported more cases of smallpox than did all the countries of continental Europe, and the United States reported more cases than any other single country, with the exception of British India.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 18021

A CASE OF PALATAL PARALYSIS

SURGICAL DEPARTMENT

First admission. A nineteen year old clerk entered for repair of a congenital inguinal hernia six years before his second admission.

He gave a history of the diseases of childhood, including diphtheria. He had influenza three years before admission. That same year his tonsils were removed. He had had cough for years.

Examination showed a mouth breather with a fairly typical adenoid facies. He had slight cough. The fingers were clubbed. A Wassermann was negative.

The hernia was repaired under local novocain. He made a good convalescence, with considerable cough.

History of interval. After leaving the hospital he came to the Outpatient Throat Room, where a diagnosis of deviated septum was made and operation was advised. X-ray examination showed no definite evidence of pulmonary tuberculosis. In the Medical Department a diagnosis of chronic bronchitis was made. His last visit was two months after his discharge.

Second admission. Six years later he came to the Emergency Ward complaining of difficulty in swallowing and nasal regurgitation.

Four days before readmission he felt nauseated and vomited several times. For the two following days he felt ill and his gastro-intestinal symptoms continued. On the third day he complained of nasal regurgitation and later dysphagia. The symptoms became more intense. He developed some difficulty in breathing and cyanosis of the face. He had some fever.

No other history was obtained.

Examination showed a well-nourished man in respiratory distress, with cyanosis of the face, lips and hands. The lung expansion was fair. The lungs were clear. The heart was not remarkable. The blood pressure was 120/80. The abdomen was negative. There was palatal paralysis, more marked on the right, and dysphagia. The pupils and reflexes were normal.

A smear from the throat showed no diphtheria, a culture no growth. A Wassermann was negative. No other laboratory work was done.

The temperature, pulse and respirations were not recorded.

The night of admission the patient swallowed several glasses of water. Twelve hours after admission, he suddenly developed pulmonary edema. He was put into the respirator, where he remained from ten a. m. to seven p. m. without regaining consciousness. An hour later he died.

CLINICAL DISCUSSION

BY MAURICE FREMONT-SMITH, M.D., RICHARD C. CABOT, M.D., AND TRACY B. MALLORY, M.D.

DR. FREMONT-SMITH: If the fingers are really clubbed we have a very definite piece of evidence. We should think of subacute bacterial endocarditis, congenital heart disease, pulmonary abscess, or bronchiectasis of long standing. Are there any other causes of clubbing?

DR. CABOT: Chronic pleurisy is a common cause; also certain ones of the ordinary rheumatic heart diseases give clubbed fingers and others do not. It is one of the most mysterious of all symptoms.

DR. MALLORY: Dr. Churchill had an extraordinary case of primary cancer of the bronchus, a cancer the size of a pea, obstructing the bronchus to one lobe only. The symptom which brought the patient to the doctor was pain in his clubbed fingers. It was in investigating the cause of the clubbed fingers that they found the cancer.

DR. FREMONT-SMITH: I think we can say this man did not have pulmonary tuberculosis if the story of cough is true. If a patient has pulmonary tuberculosis with cough for years there is very little difficulty in finding evidence of tuberculosis at physical examination, and we certainly should find evidence of it at x-ray examination.

Difficulty in swallowing and nasal regurgitation imply that his palate was paralyzed. The soft palate being paralyzed, every time he swallowed the food was not only not forced down the throat, but was allowed to go out through the nose. The condition in which we see that characteristically is postdiphtheritic paralysis. We have here no history of illness suggestive of diphtheria immediately preceding the second admission. Moreover we have a history of diphtheria in childhood. He may not have had that in childhood; it is more than possible that it was a streptococcus throat. It is rather unusual to have diphtheria cause paralysis, when the diphtheria is so slight that the patient does not know he has been sick. Usually we get paralysis in rather severe diphtheria, and the paralysis, which is of course peripheral neuritis, may occur quite early, within a few days, or it may occur, and I think it characteristically does occur, quite late, after the patient is well over the

acute attack, up to two months after the onset of sore throat.

To me this story is much more suggestive of the other possibility, poliomyelitis. The four days' history before the onset of the paralysis is about the right time. The nausea and vomiting are part of the picture. We can have a high poliomyelitis with no other paralysis. What happens of course is that the nuclei of the lower cranial nerves are involved and we have paralysis of the respiratory center if it happens to hit it, or the vagus center, or the ninth nerve, with difficulty in swallowing; not so frequently involvement of the nuclei of the soft palate as of the other lower cranial nerves.

What other condition could possibly give the same picture? The only other thing I can think of is bulbar paralysis. Bulbar paralysis is of course what we do get in poliomyelitis. When we speak of bulbar paralysis however we usually mean slowly progressive disease in which there is gradual involvement first often of the tongue, of the chewing muscles, of the muscles of deglutition, particularly of the lips, with tremor and difficulty in pronouncing certain of the consonants, especially the *l*'s. The progression of the disease is slow. We have a lesion in the nuclei of these same lower cranial nerves, only it is not an acute condition such as is poliomyelitis. In this case the condition has come on too rapidly for chronic bulbar poliomyelitis.

The cyanosis I suppose might be due to paralysis in the respiratory center or to paralysis of the abductors of the larynx, in which case we can have falling together of the two vocal cords and difficulty in breathing.

One would expect that a lumbar puncture would have been done. Probably the patient was not too sick, because lumbar punctures have been done in the hospital on patients just before death. He probably died too soon, before they came to it. Was there a lumbar puncture done?

Miss Painter: No.

Dr. Fremont-Smith: I shall have to make a diagnosis of high poliomyelitis. I think that is more likely than postdiphtheritic paralysis. I do not see why a postdiphtheritic paralysis should cause death unless the vagus became involved. Are there any other suggestions?

A Student: I do not see how you can rule out diphtheria there.

Dr. Fremont-Smith: I do not think I have ruled it out. I think however one would expect a recognized history of diphtheria in a person of nineteen.

A Student: Do these patients often have acute pulmonary edema?

Dr. Cabot: I think they do, and we do not see that in diphtheria.

Dr. Fremont-Smith: Why do they have it in poliomyelitis, Dr. Cabot?

Dr. Cabot: Simply from respiratory failure owing to involvement of the respiratory center.

Dr. Mallory: There is one interesting thing about the group of poliomyelitis cases we have had this autumn. A very large proportion of the patients have had extraordinarily rapid heart beats, a pulse of 150 to 160 even when the patients did not show much other evidence of being extremely ill. All of those have had marked pulmonary edema, and all died as though from lack of vagal slowing of the heart.

Dr. Fremont-Smith: As though really from congestion, acute left sided failure.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Acute anterior poliomyelitis.

DR. MAURICE FREMONT-SMITH'S DIAGNOSIS

Acute poliomyelitis.

ANATOMIC DIAGNOSES

Bulbar poliomyelitis.
Bronchopneumonia.

Pathologic Discussion

Dr. Mallory: This patient did have bulbar poliomyelitis. In that group of cases of course the clinical prognosis is particularly bad.

Most of these bulbar cases before dying show some degree of bronchopneumonia. That was true in this case. Scattered throughout all the lobes of both lungs were numerous small patches of pneumonic solidification.

Dr. Cabot: Probably due to inhaling septic material?

Dr. Mallory: I think very probably. Most bulbar cases have very wet breathing, probably because the patients are unable to swallow saliva. It is often necessary to keep a suction apparatus in the throat almost constantly. Even at the foot of the bed one can hear bubbles in the trachea.

There is practically nothing to be found outside the spinal cord in these cases except generalized hyperplasia of the lymph follicles, sometimes with actual necrosis. That is the standard finding. They all show it to some degree, though it varies in intensity from case to case. It is apt to be most marked in the intestinal tract. The Peyer's patches are usually involved. Some people use that as an argument to prove that the entrance is via the intestinal tract. I think it is a poor argument. Such lesions are only evidence of general toxemia, not of the local presence of a virus. Out of the six cases of bulbar poliomyelitis this autumn three or four seem to have died a cardiac death rather than a bulbar death. Those cases had a very rapid heart beat, as though the vagal control had been abolished.

Dr. Cabot: Is there any general passive congestion outside the lungs in these cases of cardiac failure?

Dr. Mallory: The liver occasionally has shown moderately acute congestion and the right heart has been somewhat dilated. The findings are not very striking.

Dr. Cabot: Did you see anything in the bulb in gross?

DR. MALLORY: We usually can. We were able in this case to see definite local congestion in the gray matter of the bulb, which we did not find in the other levels of the cord, enough to make us quite sure in gross that we were dealing with poliomyelitis.

CASE 18022

ABDOMINAL PAIN, CONSTIPATION AND VOMITING WITHOUT LOCALIZING SIGNS

SURGICAL DEPARTMENT

PRESENTATION OF CASE

DR. GRAY H. TWOMBLEY*: A fifty-five year old white American house painter came into the Emergency Ward complaining of abdominal pain of one day's duration.

Three years earlier he had been in the hospital with a right femoral hernia. He was operated on by Dr. Linton. The patient was extremely uncoöperative, got out of bed immediately after the operation, and was finally discharged practically against advice.

His story when he came into the Emergency Ward was that he had last moved his bowels two days before entry. A week before that time he had run out of his favorite laxative. At two o'clock in the morning before entry he awakened with very severe generalized abdominal pain. He said that he vomited five times. When he came into the Emergency Ward he was not really vomiting but seemed to be trying to vomit; he was retching and spat up a little saliva. He had taken five enemas and had had no result.

He was very uncoöperative. When we tried to examine his abdomen he said he did not want to be examined but only wanted something for his pain. We kept him in the Emergency Ward. He did not seem particularly sick when his attention was diverted. The abdomen was soft. The white blood cell count was 10,000. He vomited three or four times. He was given a number of enemas with no result. He had a moderately tight stricture of the rectum. He was seen by Dr. Shedden and sent up to the ward. Enemas were still without results, therefore he was given a barium enema to see if we could find the obstruction. The x-ray report was that there were a number of dilated loops of ileum above the ileocecal valve and that the cecum was irregular. An unofficial x-ray report was that they thought the man had carcinoma of the cecum.

Exploration under spinal anesthesia showed no evidence of carcinoma, but for about a foot above the ileocecal valve there was an area of ileum which showed slight thickening and reddening and a few punctate hemorrhages. There was nothing really to account for the picture he presented.

About an hour after the operation one of the house officers coming to the ward found the patient out of bed, sitting up in a chair. He said that he had got up because he did not feel comfortable. He said that the last time he was operated on and got up it did not do any harm and he did not see why he should not do it again. About three hours later he was discovered alone halfway up the stairs to Ward 29.

The next morning he obviously had pneumonia. He was cyanotic and his respirations, pulse and temperature were elevated. He was shifted back to the ward and put into an oxygen tent, but would not stay in it. He was given 6 drams of paraldehyde by rectum without effect. He was also given numerous doses of luminal intravenously, 6 grains at a time, also without much effect. He merely continued to fight. It was all we could do to keep him in bed even with special nurses. We finally gave up giving oxygen because of his lack of coöperation. He gradually developed signs of paralytic ileus. A nasal tube was passed and 28 ounces of material taken from the stomach. He died six days after operation.

AN INTERNE: A smear done when he entered the Emergency Ward showed no stippling.

DR. TWOMBLEY: He had only one smear.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Subacute intestinal obstruction, cause undetermined.

Bronchopneumonia.

ANATOMIC DIAGNOSES

Lead poisoning?

Atheromatosis.

Acute congestion of the lungs.

Arteriolar sclerosis.

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY: The interesting feature of this case at autopsy was that in spite of all the fulminating clinical symptoms of acute disease we did not find anything. The intestinal tract was absolutely negative except for marked distention of the small intestine, including the terminal ileum, such as one might well see in paralytic ileus. We could not find any definite thickening of the ileum such as that apparently found at operation. We examined it very carefully from one end to the other. It was absolutely negative.

The lungs showed acute congestion. Microscopically we could find here and there an alveolus containing a little exudate, but practically speaking I should say he had no real pneumonia.

We were quite baffled by the case. One thing that occurred to us at once as a possibility was lead colic. Such urine as was left in the bladder was examined for lead, as we knew he was a painter. Sixty or seventy cubic centimeters of urine gave a definite trace of lead, whereas I understand in the usual tests they use a liter

*Senior interne on the West Surgical service.

and consider a trace significant. So he must have had a fairly heavy amount of lead in his blood.

DR. OLIVER COPE: He had a history of lead colic about twenty years ago. It was partly on that basis and partly because of our inability to make any diagnosis that we considered that. He had no stippling. We looked very carefully for it, and as I remember it the smear was well stained.

DR. MALLORY: We made a smear at autopsy and could find no stippling then either.

DR. COPE: He had no attacks between the one twenty years ago and the present one.

DR. JAMES C. WHITE: Do you suppose his mental symptoms could be due to lead poisoning? We do see cases of lead encephalitis.

DR. MALLORY: We did not examine his head.

He had quite a marked definite common atheromatosis. Some of the arterioles show extremely marked hyalin degeneration. The same thing is present in the kidney, though there it is a little less striking. There is practically no evidence of a process in the glomeruli. He had quite a marked atheromatosis of the aorta with big cholesterin deposits. Such vascular changes are common findings in lead poisoning, though of course not in the least specific.

DR. CHESTER M. JONES: The case is interesting in relation to a case of possible periarteritis nodosa we have in the ward now. This patient has been sitting up in bed pressing her abdomen not infrequently with very severe abdominal pain which I think may possibly be accounted for on a similar basis. Her pain is not so severe as this patient's, but it is very severe indeed, and it has been a constant picture for a month and a half. She certainly has a high degree of infiltration and involvement of the smaller arteries of the belly and muscles.

DR. MALLORY: There are many reported cases of operations in periarteritis nodosa on account of severe abdominal pain.

DR. WALTER BAUER: In a case of this sort one must remember that the basophilic stippling of red cells may vary markedly from day to day, being present on one occasion and absent on another, therefore repeated blood smear examinations are sometimes indicated. I think if there is any question of doubt as to the cause of the abdominal colic the patient should be given calcium chloride intravenously. In patients suffering from lead colic the intravenous administration of calcium chloride is followed by immediate relief of all pain. Such relief may be permanent or may last only a few hours. This form of therapy has been found to be of considerable help in the differential diagnosis of cases such as the one reported this morning. I do not think we can say that this man did not have lead poisoning. I do not believe however that the mental symptoms referred to in this case were secondary to lead encephalitis.

DR. HOLMES: The x-ray findings could be explained on the basis of spasm due to lead poisoning.

DR. MALLORY: One other point that I think is often forgotten in relation to lead poisoning is that there is no necessity for recent exposure. At the City Hospital they had a man who had had a heavy exposure twenty years ago and none later. Not for any medical reason, but just because he liked it, he had drunk between one and two quarts of milk every day until recently, when he decided that it was too expensive and stopped drinking it. Then definite symptoms of lead poisoning developed. Autopsy showed a negative gastro-intestinal tract.

DR. JAMES H. MEANS: Dr. Aub showed that if patients with a slight amount of lead get drunk or short of nutrition they may get acidosis and lead colic. Had he been an alcoholic recently?

DR. TWOMBLEY: Not so far as we could determine.

DR. MALLORY: There is one other possibility. The final illness of a former staff member of this hospital showed many similarities to this case. He had acute abdominal pain. He was explored and a small area of the ileum showed bright hemorrhagic spots all through the serosa. Nothing else was found. He went on to develop a paralytic ileus and died. At autopsy we could find nothing whatever. The original focus had disappeared. I have seen a third case with an apparently similar lesion in the upper jejunum. It is not impossible that there is some other disease entity as yet unrecognized.

DR. COPE: This man showed at operation perfectly definite thickening and ecchymosis at the lower end of the ileum for about a foot, so marked that I questioned at the time whether he had not had a volvulus which had reduced itself previous to operation, before spinal was given. There was nothing to account for the thickening. He lived six days after operation, so it is a possibility that with return to normal circulation the edema might have been taken care of.

DR. JONES: Is it possible that there could have been a big intussusception?

DR. MALLORY: I certainly cannot rule it out.

DR. COPE: That would have been perfectly consistent with the operative findings.

DR. JONES: After all, that localized edema is not what one would expect in lead colic, is it? It is rather surprising to find edema in only one place.

DR. COPE: May I ask Dr. King whether he thought this man had pneumonia?

DR. DONALD S. KING: Yes, I did. I was very much surprised that the lungs showed no more at autopsy. There was marked dullness and bronchial breathing all through the right chest the day before death, so I thought that pneumonia was at least part of the cause of death. They found nothing at autopsy but acute congestion.

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

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SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $7.56 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 8 The Fenway.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 8 The Fenway, Boston, Mass.

"K MEDIUM"

THE press has recently given considerable prominence to certain observations by Kendall of the Northwestern University Medical School. Official publications[1] indicate that he has secured astonishing bacteriologic results by using a culture medium, the so-called "K medium," prepared from animal or human small intestine, previously extracted with alcohol and benzol and, consequently, relatively protein-rich and peptone-free. In the first place, positive blood cultures were obtained "quite readily" from cases of disease, such as, common cold, influenza, rheumatic fever, rheumatoid endocarditis, arthritis, measles and German measles, which usually yield sterile cultures by ordinary technique. Secondly, when non-filterable bacteria, such as, staphylococci, streptococci, typhoid bacilli and paratyphoid bacilli, were cultivated in this medium, filtrates passed through Berkefeld candles and reinoculated into the same medium eventually yielded, on subculture to peptone rich agar media, organisms morphologically and serologically identical to the original strains.

On the basis of these observations Kendall has brought forth certain fundamental ideas in regard to bacteria and to bacterial infection. He postulates that the majority of, if not all, known bacteria can exist in a non-filterable or a filterable state. The former is determined by growth in a relatively peptone-rich protein-free medium—represented *in vitro* by ordinary culture media and *in vivo* by the contents of the gastro-intestinal tract or by accumulations of pus. The latter is determined by growth in a relatively protein-rich peptone-free medium—represented *in vitro* by "K medium" and *in vivo* by the normal body tissues. If an organism invades the barrier presented by the mucosa of the oral cavity or the respiratory tract, there is a tendency for it to become ultramicroscopic and filterable, since the tissue cells are protein-rich and peptone-free. If, on the other hand, bacteria invade the gastro-intestinal mucosa, they retain their usual morphology and ability to resist filtration, as such tissue cells contain an abundance of protein derivatives absorbed from the gastro-intestinal contents. He believes that the etiologic factors involved in diseases caused by "filterable viruses" have failed of recognition because of lack of proper cultural conditions for such filterable forms and, in support of his general hypothesis, states that many, if not most, of these viruses gain entrance to the body through the respiratory tract, rather than through the intestinal tract.

Kendall's observations are most unique and extraordinary, but must, of course, be confirmed by other investigators. Readily obtained positive blood cultures from cases of disease, such as, common cold, influenza, arthritis and measles, leave one somewhat aghast. Fifty years of intensive bacteriologic study in diseases of this sort have failed to yield convincing results. "K medium" and the concepts developed from its application may provide the opening wedge for further knowledge.

REFERENCE

1 Kendall, A. I.:, Northwestern University Bulletin, 1931, XXXII, Nos. 5 and 8.

SUGGESTED COMMUNITY STUDIES

THERE are hopeful signs afield that the White House Conference, in addition to being a flow of reason, has set forces in motion that are gathering impetus as they roll. It would be unwarrantedly facetious to compare it to John Brown's body of Civil War fame, but they have one attribute in common—their souls are still marching on. Already, as we have previously indicated, many of the states have held follow-up conferences and others have signified their intention of so doing in the near future; the completed volumes of the conference are com-

ing from The Century Company's Press, *ad seriatim,* and the Children's Charter is becoming a familiar bill of rights. It looks as if the child were coming into his own.

There has now emanated from the Public Relations office of the White House Conference a working pamphlet based on the findings of the Conference and bearing the title "Suggestions for Three Community Studies." These three studies are in the fields of Public Health Service, Education and Training and the Care of the Handicapped.

So far as public health service and administration are concerned, it is interesting to note that the Conference reported only 505 counties representing 24 per cent. of the rural population of the United States as having full-time health service. Extension of such service is highly to be desired. A recommended "Drink More Milk" campaign, in this sophisticated age, fails to stir the imagination as perhaps it should; a campaign which specialized in the safety rather than in the quantity of milk consumed would seem to be more to the point, especially to those of us who are becoming a little reactionary to the milk propaganda.

In education and training the organization of child study groups for faculty members is recommended, and of course the periodic health examination as part of a school health service is receiving its share of attention. This school health service, according to the recommendations, should be carried on in coöperation with home and community agencies, should be essentially educational and should consider the welfare of the whole child, including the mental, emotional, social and physical aspects of health. Immunizations naturally have their place in the program, and one forward-looking recommendation deals with the manner in which children spend their leisure time. This has been too much neglected in the past; it is a question whether children of the future will have any leisure. The importance of parents as the greatest controlling influence in the lives of their children is emphasized, as is the importance of continued education and guidance of both fathers and mothers for this important rôle of parenthood.

The handicapped child is considered under the headings of dependency, delinquency, the physically and mentally handicapped and organization for the socially, physically and mentally handicapped. Adequate state legislation to protect children from abuse and neglect is recommended, as are community agencies to deal with the child on the basis of an understanding of the individual delinquent and the environment by which he is affected.

Many of the recommendations will seem trite, but if the whole problem is attacked with force, with enthusiasm and with constancy, much good will come of it.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

CLUTE, HOWARD M. B.S., M.D. Dartmouth Medical School 1914. F.A.C.S. Surgeon, Lahey Clinic. Visiting Surgeon, New England Baptist Hospital. His subject is "Operative Procedures in Common and Hepatic Duct Injuries." Page 47. Address: 605 Commonwealth Avenue, Boston.

STETSON, HALBERT G. M.D. College of Physicians and Surgeons 1895. F.A.C.S. Surgeon on Staff of Franklin Co. Public Hospital, Greenfield, Mass. President, Massachusetts Medical Society. Address: Greenfield, Mass. Associated with him is:

MORAN, JOHN E. M.D. University of Maryland 1927. Associate of Dr. Halbert G. Stetson. Address: 39 Federal Street, Greenfield, Mass. Their subject is "Endometriosis." Page 52.

VIETS, HENRY R. B.S., M.D. Harvard University Medical School 1916. Instructor in Neurology, Harvard Medical School. Assistant Neurologist, Massachusetts General Hospital. Address: 6 Commonwealth Avenue, Boston. Associated with him is:

CLIFFORD, MILTON HENRY. A.B., M.D. Harvard University Medical School 1931. Medical House Officer, Peter Bent Brigham Hospital. Address: 721 Huntington Street, Boston. Their subject is "Paraplegia Associated with non-Tuberculous Kyphoscoliosis; A Case Report and a Survey of the Literature." Page 55.

PRATHER, GEORGE C. M.D. Harvard University Medical School 1924. Assistant Urologist, Boston Lying-in Hospital, Beth Israel Hospital and Newton Hospital. Address: 99 Commonwealth Avenue, Boston. Associated with him are:

CRABTREE, E. GRANVILLE. Ph.B., M.D. Harvard University Medical School 1914. F.A.C.S. Urologist to the Boston Lying-in Hospital. Address: 99 Commonwealth Avenue, Boston. And

ROBINS, SAMUEL A. M.D. Tufts College Medical School 1914. Director, X-Ray Department, Beth Israel Hospital. Roentgenologist, Boston Lying-in Hospital and Evangeline Booth Hospital. Clinical Professor of Roentgenology, Tufts College Medical School. Address: 636 Beacon Street, Boston. Their subject is "Intravenous Pyelography During Pregnancy." Page 62.

PRATT, JOSEPH H. Ph.B., A.M., M.D. Johns Hopkins University School of Medicine 1898. Professor of Clinical Medicine, Tufts Medical School. Physician-in-Chief, New England Medical Center. His subject is "The Development of the Rest Treatment in Pulmonary Tubercu-

losis." Page 64. Address: 270 Commonwealth Avenue, Boston.

ROBERTS, STEWART R. A.B., B.S., S.M., M.D. Emory University 1900. Professor of Clinical Medicine, Emory University. Physician to Emory University Hospital. Ex-President, Southern Medical Association. His subject is "The Art and Human Nature." Page 70. Address: 768 Juniper Street, Atlanta, Georgia.

ROCK, JOHN. S.B., M.D. Harvard University Medical School 1918. F.A.C.S. Assistant in Obstetrics and in Gynecology, Harvard University Medical School. Obstetrician to Out-Patients, Boston Lying-in Hospital. Assistant Obstetrician, Massachusetts General Hospital. Surgeon to Out-Patients, Free Hospital for Women, Brookline. His subject is "Progress in Obstetrics." Page 77. Address: 198 Commonwealth Avenue, Boston.

MASSACHUSETTS LEGISLATIVE NOTES

House No. 179—An Act providing for Physical and Mental Examinations of Children complained of as School Offenders.

Be it enacted by the Senate and House of Representatives in General Court assembled and by the authority of the same, as follows:

Chapter seventy-seven of the General Laws is hereby amended by inserting after section five the following new section:—

Section 5A. For the guidance of the court or magistrate before whom a child is about to be tried for an offence under section three, four or five, the court or magistrate shall cause such child to receive thorough physical and mental examinations, under rules and regulations prescribed by the commissioner of mental diseases, prior to disposition of the case. In case of commitment of any such child to a county training school, the court or magistrate shall cause copies of the reports showing the result of such examinations, and of any investigation made by the supervisor of attendance or probation officer covering the character, school record, home surroundings and previous complaints against such child, if any, to be forwarded to the superintendent of such school, together with the warrant of commitment.

MISCELLANY

THE APPOINTMENT OF DR. JACOB KASANIN

Dr. Jacob Kasanin, who for several years has been connected with the Boston Psychopathic Hospital and who for the past three years has been Research Associate in Psychiatry at that institution under a fund allocated by the Laura Spelman Rockefeller Foundation, was appointed Clinical Director at the State Hospital for Mental Diseases, Howard, Rhode Island, December 1, 1931.

THE APPOINTMENT OF DR. BRETLER

Dr. Louis R. Bretler has been appointed to the position of resident physician at the Boston City Hospital.

THE ALLEGED DISCOVERY OF THE GERM WHICH CAUSES ANTERIOR POLIOMYELITIS

The announcement has been made that Dr. Frederick Eberson, Assistant Clinical Professor of Medicine of the University of California Medical School, claims to have demonstrated the germ which is responsible for infantile paralysis.

The statement sets forth that the germ has been developed from the invisible to the visible state and the typical disease has been made to affect experimental animals.

If these claims are verified this discovery will stand as one of the great contributions to medicine.

NOTICES

THE LAWRENCE CANCER CLINIC

The regular Lawrence Cancer Clinic, to be held at Lawrence General Hospital, One Garden Street, Lawrence, Tuesday, January 19, at 10 A. M., sharp, will be a Demonstration Clinic with Channing C. Simmons, M.D., of Boston, Surgeon to the Collis P. Huntington Memorial Hospital, Boston, present as consultant. You are invited to accompany any of your patients whom you desire shall have this service, or to send them with a note, and a report will be returned to you. This service is gratis. Your attendance at the Clinic is always welcome.

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MEDICAL CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

At 3:30 P. M., on Thursday, January 21, in the Amphitheatre of the Peter Bent Brigham Hospital, a medical clinic will be given by Dr. Henry A. Christian, to which physicians are cordially invited. The clinics will be held regularly on Thursday afternoons.

ANNOUNCEMENT

Harry Bancroft Goodspeed, M.D., announces the opening of his office at 36 Pleasant Street, Worcester, Massachusetts.

NOTICE

An inspector of the Food and Drug Administration of the Federal Government would like to have information furnished by physicians as to the deleterious effect of large doses of iodide of potassium or lobelia which are ingredients of a so-called asthma medicine.

Reports to the *Journal* office will be forwarded to the inspector.

REMOVAL

Louis Feldman, M.D., announces the removal of his office to the Professional Building, 270 Commonwealth Avenue, Boston, Massachusetts.

NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL

Half Century of Service

The Anniversary Dinner of the Faculty Association of the New York Post-Graduate Medical School and Hospital, to which invitations have been issued this week, marks the rounding out of a half century of service by this pioneer institution of graduate medical education in the United States.

The speakers, as announced, are to be Ray Lyman Wilbur, Secretary of the Interior; Nicholas Murray Butler, President of Columbia University; and Dr. George H. Meeker, Dean of the Graduate School of Medicine, University of Pennsylvania.

This dinner is to be held at the Hotel Biltmore on Saturday evening, January 30, and reservations may be made through Dr. Jerome Selinger, 121 East Sixtieth Street.

TWO AWARDS

The New England Society of Psychiatry, at its next Spring meeting, will make two awards, one of $100.00 and one of $50.00, to the writer (or writers) of the best papers published during the calendar year of 1931 embodying *research in psychiatry* by a younger worker (or workers). Physicians, psychologists, social workers, or others are eligible. Membership in the Society is not a requisite.

Writers who have once received an Award are not again eligible. Seasoned writers, senior physicians, or heads of departments in which there are junior workers, while not inevitably excluded, will not generally be regarded as eligible for the Awards.

The work on which the papers are based should preferably have been done in New England or by workers now living in New England.

The papers will be examined by a Committee of three members who are accustomed to reviewing papers, and by the Executive Committee of the Society. They will be judged on the basis of their scientific quality.

Reprints of articles or marked copies of journals in which the articles appeared should be sent before February 1, 1932, to the Secretary of the Society.

Superintendents of institutions, public or private, for the care of mental patients in New England are requested to post this notice and send to the Secretary a list of such papers published by the members of his staff as he thinks entitled to be considered for the Awards.

Harlan L. Paine, M.D., *Secretary.*

North Grafton, Mass.

RADIO HEALTH MESSAGES

January-February-March, 1932

Sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

Courtesy WBZA. Thursdays at 4:50 P. M.

January

21 Do Your Feet Hurt?
28 Lobar Pneumonia

February

4 Health in Industry
11 Growing Strong Teeth
18 The Common Cold
25 Whooping Cough

March

3 The Psychology of the Crippled Child
10 Personal Rights vs. Public Safety
17 Electrical Hazards in the Home
24 Can High Blood Pressure Be Avoided?
31 Rose Cold and Hay Fever

State House Broadcast

Sponsored by the Massachusetts Department of Public Health.

Courtesy WEEI. Fridays at 12:30 P. M.

Health matters of public interest discussed by the Division Directors of the Department.

Radio Health Forum

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEI. Fridays at 4:50 P. M.

Questions on Health and Prevention of Disease may be sent to: Radio Health Forum, State Department of Public Health, State House, Boston.

Special Series of Broadcasts

Sponsored by the Massachusetts Department of Public Health.

Courtesy WEEI. Mondays at 7:15 P. M.

White House Conference on Child Health and Protection

Round Tables

1932

January

18 Round Table No. 5—Unto the Least of These
Conducted by Mr. Alfred F. Whitman

BOSTON CITY HOSPITAL

STAFF CLINICAL MEETING

The January Clinic at the Boston City Hospital will be held in the Surgical Amphitheatre, January 19, 1932, at 8 P. M.

Dr. David Rapport (Professor of Physiology Tufts Medical School), "The Physiological Aspects of Dyspnea."

Dr. George P. Sanborn (Immunological), "Allergic Dyspnea."

Dr. Thomas K. Richards (Surgical), "Dyspnea in College Athletes."

Dr. Cadis Phipps (Physician-in-Chief), "Discussion."

COMMITTEE ON CLINICS,
Boston City Hospital.

REPORTS AND NOTICES OF MEETINGS

PROCEEDINGS OF THE BOSTON PATHOLOGICAL SOCIETY

A meeting was held at the Boston City Hospital, Pathological Laboratory, October 14, 1931, Dr. Timothy Leary presiding.

A large and interesting series of gross specimens was demonstrated by Dr. Mallory and his assistants. After this general demonstration the following special demonstrations were given:

I. Dr. Budd: J. K., a white female 31 years of age, in January, 1931, had an attack of paralysis with sensory disturbances in the lower extremities. During the succeeding months there was partial recovery of function. In September, 1931, there was a recurrence and the patient succumbed after a few days.

The important finding was a subacute degeneration of the spinal cord characterized by (1) disappearance of myelinated tracts, (2) infiltration of large mononuclear phagocytes and (3) gliosis. The fasciculus gracillus was affected throughout the entire course, the anterior white columns in the lower dorsal and lumbar regions and the left lateral white column in the upper lumbar segments.

The distribution of the lesions did not conform to recognized system diseases and only in the posterior columns was degeneration of a Wallerian type. No etiology for the degeneration was demonstrated.

II. Dr. Irwin: A white male 26 years of age, occupation unknown, had an appendectomy in March, 1931. The wound drained 18 days. A stitch abscess developed three weeks after discharge from the hospital. This rapidly healed.

Seven weeks after operation the patient had fever, anorexia, loss of twenty pounds of weight and pain across the body at the level of the diaphragm. After one month, a laparotomy was performed. Multiple liver abscesses and pus pockets between the liver and diaphragm were found. Death occurred 9 weeks after the operation.

Essential postmortem findings:

1. A draining sinus in the left upper quadrant of the abdomen
2. Good healing of all appendectomy scars
3. Abscesses between liver and diaphragm
4. Thrombus at bifurcation of portal vein at the liver
5. Liver 1800 gms. Numerous "honey-comb" abscesses up to 8 cm. in diameter. The smallest units were 8 mm. in diameter. No definite "sulphur granules".

   Smears and sections show colonies of actinomyces.

III. Dr. Hazard: J. H., aged 53 years, was admitted complaining of nausea. Six days previously he had been exposed to the cold and afterward felt dizzy and noticed his urine was cloudy and small in amount. On his doctor's advice he came to the hospital. Examination showed edema of the eyelids and legs. His urine contained many red cells, white cells and casts and showed a positive test for albumin. NPN was 90. He became drowsy, completely anuric and his NPN rose to 214 just before death three weeks after admission.

Autopsy revealed: (1) edema of the legs, (2) kidneys with a combined weight of 590 grams and showing small hemorrhages after stripping the capsule, and on the cut surface.

Microscopic examination of the kidneys revealed: (1) marked capsular proliferation, (2) endothelial proliferation and polymorphonuclear infiltration in the tufts, (3) tubules undergoing degeneration and filled with red cells. The diagnosis was acute glomerular nephritis.

IV. Dr. Kirkwood: A blacksmith, 63, entered the hospital complaining of abdominal enlargement and diarrhea alternating with constipation for several weeks, and of weight loss for five years. Examination demonstrated an enlarged, nodular liver, abdominal fluid, slight urinary sugar, and fasting blood sugar of 242. Contact with copper was not established. Death terminated a two weeks' downhill course.

Autopsy revealed a 3840 gm., chestnut-brown, finely granular liver with varying-sized, soft, white nodules throughout. The pancreas was firm and brown.

Microscopic examination showed deposition of golden-brown hemosiderin in macrophages, fibroblasts, and parenchyma of the liver, pancreas, spleen, pancreatic nodes, kidneys, adrenals, stomach, duodenum, and bone marrow; and similarly of greenish-blue staining hemofuscin in the liver, pancreas, and spleen. The liver presented also periportal fibrosis, central necrosis, and infiltration with cords of large, polygonal, non-pigmented tumor cells. Pancreatic fibrous tissue was increased.

Hemochromatosis (hemosiderosis, pigment cirrhosis, chronic pancreatitis) and primary liver cell carcinoma were therefore diagnosed.

V. Dr. Steele: This girl had severe tonsillitis at five; questionable rheumatic fever followed by ton-

sillectomy at six; and was then treated intermittently at the Children's Hospital for chronic multiple arthritis until eleven. Urinary casts, red cells, and albumin were observed first at eleven. A medical consultant suggested amyloidosis. At fourteen she entered the Massachusetts General Hospital with edema of legs, blood pressure of 230/170, albumin, casts, and red cells in urine. She reëntered at fifteen with additional findings of albuminuric retinitis and enlarged heart. At sixteen she entered the Boston City Hospital with symptoms, physical and laboratory findings unchanged except for NPN of 200. Clinical diagnoses were: Chronic glomerular nephritis with acute exacerbation, hypertension.

Autopsy findings: Weights: Heart 500 gms., kidneys 230 gm., kidney surface was moderately granular. Microscopically, there was amyloid in the sclerosed glomeruli and arteriole walls, and crescent formation with polymorphonuclears in the capsular spaces. Pathologic diagnoses: Cardiac hypertrophy, amyloid nephritis, acute capsular nephritis.

VI. Dr. Shiling: A 48-year-old white male entered the hospital June 5 complaining of dyspepsia for the previous month associated with 8 lbs. weight loss, dyspnea and mild unproductive cough. Physical findings and x-ray revealed an area of consolidation in right infraclavicular region. While in the hospital the patient developed a blood-tinged pleural effusion. Beginning September 10, the patient had severe attacks of dyspnea, orthopnea and cyanosis associated with distention of veins of neck and face and died in such an attack on September 17, three and a half months after admission.

Autopsy revealed a large mediastinal mass centering about hilus of right lung, replacing upper and portion of middle lobe and occluding right bronchus. The mass penetrated the wall of the superior vena cava and attached to ulcerated intima was a long polyp-like thrombus peppered with tumor, almost completely occluding lumen. Grossly, metastases were noted in the pancreas, femurs, and pelvic bones.

Microscopically, tumor was consistent with so-called small-cell carcinoma of lung.

VII. Dr. Peers: This 70-year-old white American male was admitted decompensated and moribund, after increasing cardiac weakness of 18 months' duration. He also presented kyphosis and bowing of the legs, and during the past year his head had grown to require a hat one size larger.

Autopsy showed the visceral changes of generalized arteriosclerosis. The calvarium averaged 15 mm. in thickness, with increased bi-parietal diameter. The tibiae were typical of osteitis deformans. (The normal tibia is triangular in cross section, straight and slender, with all margins concave.) These were roughly round, twice normal thickness and bowed, with parallel margins. The left showed abrupt transition from the normal lower third with thin, sharp cortex, and friable, yellow, fatty marrow to a greatly thickened, indefinite cortex, and firmer, deep red, fibrous marrow. The corresponding fibula was normal, while on the right, with a completely involved tibia, the fibula showed thickening in the lower third.

VIII. Dr. Parker: The patient, male, 19, in April tore the head of the fibula from the tibia on the left. X-ray in May showed a dense shadow about 2 cm. in diameter, near the head of the tibia but apparently not connected with it. Diagnosis probably myositis ossificans. X-ray in September revealed a roughly spherical shadow, about 10 cm. in diameter, in the same region as before. Its relation to the bone could not be definitely determined. At operation for diagnosis, pieces of what appeared to be bone were removed and some soft tissue microscopically diagnosed as chronic inflammatory process, consistent with myositis ossificans. Sections of fixed tissue examined five days later showed an osteogenic sarcoma with a calcified osteoid matrix. Amputation was advised and was done. The tibia showed a tumor of bone-like consistence involving the upper 9 cm. of the bone and extending to the articular cartilage. Histologically the tumor was identical with that seen in the biopsy specimen.

THE ROSLINDALE-WEST ROXBURY MEDICAL ASSOCIATION

On Tuesday, January 5, 1932, the Roslindale-West Roxbury Medical Association was addressed by Dr. E. Everett O'Neil. Subject: "The Rôle of Injection Therapy in Surgery."

SUFFOLK DISTRICT MEDICAL SOCIETY

The December meeting of the Suffolk District Medical Society was held in the Peter Bent Brigham Hospital on Wednesday, December 16, 1931. Dr. Reginald Fitz presided.

Dr. Harvey Cushing offered a tribute to the memory of Dr. George S. Derby who was serving his second consecutive year as president of the society at the time of his death on December 12, 1931. Dr. Derby distinguished himself by his service with the Harvard Unit in the World War as his forefathers had distinguished themselves in the Revolutionary and Civil Wars. He was a great scholar and a beloved teacher and his passing leaves a vacant chair that will be most difficult to fill.

Dr. Henry Christian presented two cases of subacute glomerular nephritis. The first was a man of 41 years who had been in the hospital for a month. He had suffered from migraine for ten years, had pneumonia nine years ago, and a severe attack of influenza seven months ago. Since then he has become progressively weaker and more easily fatigued, his migraine has increased in frequency and severity, and he has had frequent dizzy spells. He developed a chronic cough, palpitation and dyspnea on moderate exertion. On entry he appeared chronically ill, tired and slightly apathetic. Exam-

ination showed an enlarged heart, a blood pressure of 170/115, and moderate sclerosis of the retinal and peripheral vessels. The urine was of a low, fixed specific gravity with a small amount of albumin and showed occasional casts and red blood cells on microscopic examination. The phenolsulphonphthalein test showed no excretion in two hours. The blood showed a moderate secondary anemia and a blood urea nitrogen of 67 milligrams per cent. On a diet containing 28 grams of protein the blood urea nitrogen fell to 50 and when the diet was increased to 36 there was a further fall to 21 milligrams per cent. However, when the diet was increased to 60 grams the blood urea nitrogen again rose, reaching 54 milligrams per hundred cubic centimeters. He is now on a diet containing 30 grams of protein and the blood urea nitrogen is 42. The phenolsuphonphthalein test shows five per cent. excretion in two hours.

This case illustrates that there is an optimum diet for each nephritic patient that must be determined. Retained nitrogen may be either exogenous or endogenous. If the diet is too low and the patient is losing weight there may be enough tissue destruction to result in considerable retention. However, if the kidney is able to take care of more exogenous protein, increasing the protein intake will lessen tissue breakdown and result in a smaller nitrogen retention.

The second patient was a 24-year-old man who has been under observation for sixteen months. He had frequent attacks of sore throat prior to tonsillectomy in 1929 but none since then. In 1927 he was ill for three weeks with headache, blurring of vision, and generalized edema. In 1928 he was told that he had Bright's disease by his family physician. In August 1930 he came to the hospital because he had noticed edema of the ankles in the evening and puffiness under the eyes in the morning for the previous six weeks. He had moderate generalized edema. The heart was not enlarged, the blood pressure was 154/90 millimeters of mercury. The urine showed large amounts of albumin, a few casts, and occasional red blood cells. Both the phenolsulphonphthalein test and the blood urea nitrogen were normal. The serum albumin was 1.8 and the serum globulin 1.1 milligrams per hundred cubic centimeters. He was placed on a relatively high protein diet and in 3 months the serum albumin was 2.8 and the globulin was 1.6. At the same time the edema disappeared. The serum albumin has varied between 2.8 and 3.5 and the globulin between 1.6 and 2.1 milligrams per cent. since that time and he has had no edema. However, the blood urea nitrogen has steadily risen from 8 to 43 while the renal function has fallen from 45% to 1% as determined by the phenolsulphonphthalein test. Serial x-rays show a progressive enlargement of the heart. It will now be necessary to reduce the protein intake in order to decrease the nitrogen retention but this will probably cause a fall in the serum albumin and edema will result.

When normal the glomerulus has the ability to pass certain things and to hold back others, but when damaged, this function is diminished and may be lost. Albumin has the relatively low molecular weight of 45,000, globulin the high weight of 80,000 to 183,000. The damaged glomerulus excretes the smaller molecule more easily and hence protein in the urine is largely albumin and the serum albumin is affected more than the globulin. Also globulin is remade by the body much more rapidly than albumin and the total serum protein deficit tends to be made up by the former. Edema results whenever the normal balance, between the osmotic pressure of the serum protein, which act to keep fluid in the circulation and the circulatory pressure in the capillaries tending to force fluid out into the tissue spaces, is disturbed. As the osmotic pressure of a protein suspension is inversely proportional to the molecular weight of the protein, it is clear that the level of serum albumin has a much greater influence on the production of edema than does the level of serum globulin and edema results whenever the serum albumin falls below 2.5 milligrams per hundred cubic centimeters.

Mr. Robert Jennings presented charts illustrating the course of those two cases and showing that edema was present whenever the serum albumin was below 2.5 milligrams per cent.

Dr. Merrill Sosman discussed three cases. A 63-year-old man who had had "gas on his stomach" for 20 years developed epigastric burning and discomfort after meals about two months before coming to the hospital. Physical examination showed moderate emaciation and an enlarged heart with a systolic murmur and thrill at the base. The clinical diagnosis was aortic stenosis and carcinoma of the stomach. Roentgen examination showed two small areas of calcification in the base of the heart, probably calcium deposits in the aortic cusps. The stomach was tremendously dilated with 100 per cent. residue at 6 hours, 80 per cent. at 24 hours and 60 per cent. at 48 hours. The patient was treated by lavage and alkalies for two days. Gastro-intestinal series then showed a much smaller stomach and a large filling defect at the pylorus. Operation revealed an annular carcinoma of the pylorus with only small regional metastases. The lesion was resected and a posterior gastroenterostomy was done. A year later the patient was apparently well and x-ray showed a well-functioning gastroenterostomy and no evidence of malignancy.

The second case was a 63-year-old woman who had been losing weight for a year and who had had dull postprandial epigastric pain, relieved by vomiting, and made worse by food for ten months. Examination showed marked emaciation, a palpable epigastric tumor, and an enlarged supraclavicular node on the left. X-ray showed an extensive filling defect of the pylorus extending half way up the lesser curvature. Exploratory laparotomy was performed disclosing an extensive inoperative malignant lesion of the stomach, which was found to be

lymphosarcoma when examined microscopically. Hence she was given ten short x-ray treatments, short in order to prevent nausea. Two months later she was discharged without any symptoms and she has subsequently fully regained her lost weight. The filling defect seen by x-ray persists, probably because fibrosis has taken place. Twelve cases of lymphosarcoma of the stomach have been seen at the Peter Bent Brigham Hospital. This case illustrates the importance of accurate pathologic diagnoses in every case of gastric malignancy as marked improvement may be expected following radiation therapy in these cases.

The third case was that of a 42-year-old woman who had a radical mastectomy for carcinoma of the breast in 1928. In May, 1929, she was brought to the Peter Bent Brigham Hospital, bedridden and in severe pain because of metastases to the pelvis. X-ray examination showed extensive involvement of the pelvic bones, upper ends of the femurs, skull, one rib, and several nodules in the lungs. She was given two x-ray treatments to the pelvis and then sent to the Pondville Hospital. Six weeks later she was given two more treatments to the pelvis. Her pain soon disappeared and in three months she was discharged because her general condition had improved greatly. In August, 1931, she was symptomatically cured and x-ray examination showed healing of the lesions in the pelvis, femurs, and rib, decrease in the size and number of pulmonary metastases and complete replacement of the lesions in the skull by new bone. At the menopause the normal breast tissue regresses and Dr. Sosman suggests that the artificial menopause produced by the x-ray treatments has resulted in a regression of the malignant breast tissue in this case.

Dr. Cushing showed ten patients upon whom he had operated in the previous two weeks. A young man had moderately severe headaches for two or three weeks and a low grade of papilledema was discovered which persisted for two weeks. There was slight facial weakness on the left. Ventriculogram showed displacement of the ventricles to the left and downward, suggesting a right parietal lobe tumor. At operation, however, a huge organized subdural hematoma was disclosed and completely removed. There was immediate symptomatic relief and the patient was able to be up in a wheel chair on the third day. Postoperatively a history of a blow to the head followed by slight headache for three weeks over a year before was obtained. Such a story is very common in these cases of subdural hematoma which were formerly called pachymeningitis hemorrhagica interna.

A forty-year-old woman with marked acromegalic features came to the hospital because of headaches and visual disturbances. The left eye was totally blind and the right showed temporal hemianopsia. A pituitary adenoma was removed by the transfrontal route. Temporal vision in the good eye began to return almost immediately but it is too early to tell whether there will be any improvement in the blind eye.

A 32-year-old man had had uncinate convulsions for three years. Examination showed some mental slowness, slight papilledema and weakness of the left facial nerve. Ventriculogram indicated a lesion over the left hemisphere. At operation a large meningioma, weighing more than 300 grams, was removed and the patient is making an uneventful recovery, completely relieved of his symptoms.

Among the other cases there were a third ventricle tumor, a parietal lobe tumor, two cerebellar cases, and three more meningiomas.

MASSACHUSETTS PSYCHIATRIC SOCIETY

A meeting of the Massachusetts Psychiatric Society was held at the Boston Psychopathic Hospital on Wednesday evening, December 30, 1931. About 70 members and guests attended. Resolutions were adopted on the deaths of Dr. J. F. Edgerly and Dr. E. C. Noble.

Mr. Frank Loveland, Jr., Director of Research in the Prevention of Crime, Massachusetts Department of Correction, presented a paper entitled "A Criminological Laboratory in the Massachusetts Correctional System."

In this paper were outlined the activities and the plans of the Division of Research for the Prevention of Crime which was established in the Department of Correction by the General Assembly during the Spring of 1931. Because of the paucity of research material available, the first project of the division has been to assist each state penal and correctional institution in the establishment of a department for the study of the offenders, which will not only produce data for research but will also give a better knowledge of the offender upon which to base individualized treatment. The department organized at State Prison consists of a director, a psychiatrist (who gives part time), a psychologist, two male and two female social workers. A thorough case history and interpretative analysis is made on each inmate upon admission. Such departments now exist at the State Prison, the Norfolk Prison Colony, and the Reformatory for Women. Plans are now being made to create such departments at the Reformatory for Men and at the State Farm.

The research work being conducted and planned by the Division is historical, descriptive and causal and includes research into the results of treatment. Two historical projects have been instituted, one in the study of admissions to Massachusetts institutions since 1806. The other is a study of what has happened to persons sentenced to serve life terms during the past fifty years. A descriptive study of the State Prison and Massachusetts Reformatory population is being made to furnish a basis for the proper development of the new institution being built at Norfolk. Although the Division of Research contemplates the study of causal relationships, exact and verified social data will be accumulated over a period of years before studies of this kind are attempted. A study illustrative of the results of treatment has been made analyzing the parole revocation rate of Massachusetts Reformatory parolees.

In addition to developing the facilities for studying the individual offender and in conducting research projects looking toward furnishing a better factual basis for the prevention of crime and treatment of offenders, the Division of Research plans to assist in the development of a professional personnel for penal administration and research by offering clinical experience to selected graduate students of the social sciences.

Dr. Winfred Overholser, Assistant Commissioner of Mental Diseases, read a paper on "Two Years' Experience of the Briggs Law (1928-1930)." The "Briggs Law," passed originally in 1921, provides for the automatic mental examination by the Department of Mental Diseases of all persons indicted for a capital offense and of all persons bound over or indicted for any offense who have previously been convicted of a felony or indicted more than once. In 1927 an amendment was passed, as a result of which the annual number of cases reported for examination has increased from an average of 84 in 1927 to 654 in 1930. Of this group, which represents a fair cross section of serious offenders, 138 or 17.1% of the number examined in 1929 and 1930, were found to be clearly or suggestively abnormal mentally. In some cases the courts have not seen fit to be guided by the Department's report, but a steadily increasing coöperation on the part of courts, prosecutors, and defense attorneys is being noted.

WINFRED OVERHOLSER, M.D., *Secretary.*

IN MEMORIAM

JONATHAN FRANK EDGERLY, M.D.

Dr. Jonathan Frank Edgerly was born on a farm in Sanbornton, New Hampshire, on May 31, 1854, the son of Timothy and Margaret (Page) Edgerly.

He attended the public schools of Sanbornton and worked his way through the Dartmouth Medical School by tutoring and teaching, receiving his degree in 1886, at the age of thirty-two, and soon after married Miss Martha F. Wood of Weymouth, Massachusetts. He then went to Champlain, New York, taking the practice of Dr. William N. Coit.

In 1913 he became assistant physician at the Channing Sanitarium in Brookline, Massachusetts, following Dr. Knowlton. From there he went to the Friends Hospital in Philadelphia. During the illness of Dr. John C. Hall, its Superintendent, he became Acting Superintendent but, because the charter required that a Quaker must hold the position, he did not become the head of the Friends Hospital at Dr. Hall's death in 1914. He then took the superintendency of Oakbourne Epileptic Colony in Westchester, Pennsylvania, where he remained for about two years.

In 1916 he moved to Lincoln, Massachusetts, where he purchased a forty-acre estate formerly owned by Mr. James and on which there was a luxurious mansion well suited for a private sanatorium which he called "Sherwood." His idea was to have four or five patients to whom he could devote his entire attention, working and playing with them; in this venture he had the coöperation and assistance of Dr. Arthur Jelly. He conducted Sherwood successfully for about twelve years. Toward the end of this period his health was failing and in 1928 he returned to New Hampshire.

Dr. Edgerly passed away at the Margaret Pillsbury Hospital in Concord, New Hampshire, on August 12, 1930, at the age of seventy-six years and three months. Bright's Disease was the cause of death.

Dr. Edgerly joined the American Psychiatric Association in 1893 and was a life member. He was also a member of the Massachusetts Psychiatric Society. He leaves a widow, Mrs. Martha F. Edgerly, and one daughter, Miss Margaret Wyman Edgerly, now Occupational Therapist at the Kushaqua Sanatorium in the Adirondacks.

Be it resolved that in the passing of Dr. Edgerly the profession has lost an astute and kindly physician and loyal friend, always modest and quiet, an idealist and lover of nature, who found his greatest satisfaction in doing well the lesser as well as the greater tasks of life.

Be it further resolved that these minutes be spread upon the records of the society and that a copy be sent to his widow and daughter with our deepest sympathy.

Adopted by the Massachusetts Psychiatric Society, December 30, 1931.

WINFRED OVERHOLSER, M.D., *Secretary.*

IN MEMORIAM

ERMY CORSER NOBLE, M.D.

Dr. Ermy Corser Noble died October 21, 1931, at Randolph, Vermont, at the age of fifty-eight. In May, 1931, while holding the position of Executive Assistant at the Pittsburgh City Home and Hospital, Pittsburgh, Pennsylvania, he suffered an attack of pneumonia accompanied by cardiorenal disease which later resulted in his death.

Dr. Noble was born at Hopkinton, New York, on August 1, 1873, and was graduated from the Normal School at Potsdam, New York. After teaching school a short time and being graduated from the Boston City Hospital as a nurse, he obtained a medical degree from McGill University in 1907. After a period devoted to general practice he joined the medical staff of the Boston State Hospital in 1910, as assistant physician, from which he was promoted through the positions of senior and first assistant physician to Assistant Superintendent in 1917. Following the death of the Superintendent, Dr. Henry C. Frost in May, 1917, until the appointment of his successor in December of the same year, he served as Acting Superintendent of the Boston State Hospital. Owing to a prolonged illness he resigned as Assistant Superintendent in April, 1928. He eventually regained his health sufficiently to reënter active psychiatric work. He served as a member of the medical staff of the Harrisburg State Hospital for one year, when through competitive examina-

tion he obtained the position of Executive Assistant of the Pittsburgh City Home and Hospital, where he remained until his last illness.

He was married on August 20, 1912, to Dr. Mary E. Gill, who survives him.

Dr. Noble was gifted with a magnetic and sympathetic personality which endeared him to his patients and won for him a large circle of friends. He showed a keen interest and aptitude in all things pertaining to psychiatry and stimulated his associates on the hospital staff to their best efforts.

For many years he was an active member of the American Psychiatric Association, Massachusetts Psychiatric Society, New England Society of Psychiatry, and the Massachusetts Medical Society.

Adopted by the Massachusetts Psychiatric Society, December 30, 1931.

WINFRED OVERHOLSER, M.D., *Secretary.*

AMERICAN HEART ASSOCIATION

The Annual Meeting of the American Heart Association will be held on Monday, February 1, 1932, at 4:30 P. M., at the offices of the Association, in the Nelson Tower, 450 Seventh Avenue, New York City.

BOSTON SURGICAL SOCIETY, INC.

All members of the profession, with their wives, are invited to a special meeting of the Boston Surgical Society to be held on Monday evening, February 1, 1932, at 8:30 P. M., at the John Hancock Hall, 90 St. James Avenue, Boston. At this meeting the Henry Jacob Bigelow medal will be awarded to Dr. John M. T. Finney of Baltimore, and he will respond with an oration on "Changing Methods in Surgery."

RICHARD H. MILLER, *Secretary.*

FRED B. LUND, *President.*

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

The annual mid-winter dinner of the Middlesex South District Medical Society will be held at the Commander Hotel, Cambridge, on Wednesday evening, January 20, 1932 at 6:30 o'clock. The speaker will be Dr. David Cheever. The subject: "Are We in Our Course Or Are We Drifting?"

Dr. Halbert G. Stetson, President of the Massachusetts Medical Society, will also be our guest. It is hoped that the Fellows of the district will attend in large numbers.

A. A. LEVI, *Secretary.*

NEW ENGLAND PHYSICAL THERAPY SOCIETY

The regular meeting of the New England Physical Therapy Society will be held at the Boston Square and Compass Club at 8 P.M. on the evening of January 20. There will be a council meeting at 6 P.M. followed by a dinner at 6:30. All members of the medical profession are cordially invited to attend.

ARTHUR H. RING, *Secretary.*

HARVARD MEDICAL SOCIETY

The next meeting will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street Entrance) Tuesday evening, January 26, at 8:15 o'clock.

Report of Cases.

Differentiation of Pituitary Adenomas by Supravital Technique. Louise Eisenhardt, M.D.

The Basophile Adenomas of the Pituitary Body and Their Clinical Manifestations. Harvey Cushing, M.D.

Medical students and physicians are cordially invited to attend.

JOHN HOMANS, *Secretary.*

BOSTON MEDICAL HISTORY CLUB

Monday evening, January 18, at 8:15 P. M., 8 The Fenway, Boston.

Ephedra in Ancient Asiatic Rituals and Medicine (With information obtained from Sir Aurel Stein). Soma Weiss, M.D.

The Mandrake. John Fallon, M.D.

Illustrated by stereopticon.

Physicians and medical students are cordially invited to attend the meeting.

JAMES F. BALLARD, *Secretary.*

BOSTON MEDICAL LIBRARY

The Annual Meeting will be held at the Library on Tuesday evening, January 19, at 8:15 o'clock. Following a short business meeting, Dr. John F. Fulton, formerly of Oxford, and now Professor of Physiology at Yale University, will give a talk on "Haller as a Medical Bibliographer." Important accessions received during the year will be on exhibition in the Supper Room.

BETH ISRAEL HOSPITAL PEDIATRIC CLUB

The next regular meeting of Beth Israel Hospital Pediatric Club will be held on Thursday, January 21, in the Beth Israel Hospital auditorium at 8:15 P. M.

Program:

Mental Hygiene in Pediatrics—D. A. Thom, M.D.

RUTH WEISSMAN, M.D., *Secretary.*

NEW ENGLAND WOMEN'S MEDICAL SOCIETY

The fifty-fourth annual meeting of the New England Women's Medical Society will be held at the Copley-Plaza Hotel on Thursday, January 21, 1932, with a dinner at 7:00 P. M. The guests and speakers will be Dr. and Mrs. William E. Chenery of Boston.

ELIZABETH V. O'NEILL, M.D., *Secretary.*

SOCIETY MEETINGS
CONGRESSES AND CONFERENCES

January 18—Boston Medical History Club. See notice above.

January 19—Boston City Hospital, Staff Clinical Meeting. See page 96.

January 19—South End Medical Club. See page 39, issue of January 7.

January 19—The Lawrence Cancer Clinic. See page 94.

January 19—Boston Medical Library. See page 101.

January 20—New England Physical Therapy Society. See page 101.

January 21—Medical Clinic at the Peter Bent Brigham Hospital. See page 94.

January 21—Beth Israel Hospital Pediatric Club. See page 101.

January 21—New England Women's Medical Society. See page 101.

January 26—Harvard Medical Society. See page 101.

February 1—American Heart Association. See page 101.

February 1—Boston Surgical Society. See page 101.

February 4 - June 1—New England Heart Association. See page 891, issue of October 29.

February 12 - May 6—William Harvey Society. See page 745, issue of October 8.

March - April, Autumn — International Postgraduate Courses in Berlin. See page 1169, issue of December 10.

April 4-8—The American College of Physicians. See notice on page 1232, issue of June 4.

May 9-13—American Medical Association, New Orleans, La.

June 8, 9, 10—Massachusetts Medical Society, Hotel Statler, Boston.

October 24-27—American Public Health Association. See notice on page 1321, issue of December 31.

October 24-28—Inter-state Postgraduate Medical Association of North America. See page 39, issue of January 7.

DISTRICT MEDICAL SOCIETIES

Essex North District Medical Society

May 4—Annual meeting at Lawrence.

Essex South District Medical Society

February 3, Wednesday—Council Meeting, Boston.

February 10, Wednesday—Hawthorne Hotel, Salem. Dinner 7 P. M. Speakers: Dr. Lincoln F. Sise and Dr. Harry H. Germain. Subject: Selection of the Anesthetic for the Patient and Operation. Dr. Sise to speak from the viewpoint of the Anesthetist, and Dr. Germain from the viewpoint of the Surgeon.

March 2, Wednesday—Lynn Hospital. Clinic 5 P. M. Dinner 7 P. M. Subject to be announced later. Speaker: Dr. Elmer W. Barron, Boston.

April 6, Wednesday—Essex Sanatorium, Middleton. Clinic 5 P. M. Dinner 7 P. M. Speaker: Dr. Arthur P. Wakefield, State Department of Health. Subject: 10-Year Tuberculosis Program in the Public Schools.

May 5, Thursday—Censors' Meeting, Salem Hospital, 3:30 P. M.

May 10, Tuesday—Annual Meeting. The Tavern, Gloucester. Speaker and subject to be announced later. Ladies invited.

Franklin District Medical Society

Meeting will be held on the second Tuesday of March and May at the Weldon, Greenfield, at 11 A. M.

CHARLES MOLINE, Secretary.

Middlesex East District Medical Society

At a meeting of the executive committee the following schedule for the Middlesex East District Medical Society was arranged:

March—At Reading.

May—At Woburn.

All meetings on the second Wednesday of each month unless otherwise announced.

Middlesex South District Medical Society

January 20—Annual mid-winter dinner. See page 101.

Norfolk District Medical Society

January 26—Boston Sanatorium, Mattapan. Dr. Timothy J. Murphy. Meeting to be devoted to Diseases of the Chest.

February 23—Place to be announced. Clinico-Pathological meeting, Dr. Frank S. Cruickshank, and Dr. J. W. Budd of the Medical and Pathological Staff of the Boston City Hospital.

March 29—Place to be announced. Boston Public Health Meeting. Speakers, Honorable James M. Curley, Dr. Francis X. Mahoney, Dr. Charles Wilinsky, Dr. W. H. Griffin.

May—Annual Meeting, date and place to be announced.

May 5—Censors' Meeting for examination of candidates. Roxbury Masonic Temple, 171 Warren Street, Roxbury, 4 P. M. Fee $10.00 payable at time of examination. All candidates will have applications in the hands of the secretary one week prior to this date. All candidates from Medical Schools not on approved list of Society must have application complete two weeks prior to date of examination.

F. S. CRUICKSHANK, Secretary.

Norfolk South District Medical Society

February 4—This meeting will be held at the Quincy City Hospital. The program will be furnished by the members of the hospital staff.

March 3—Speaker: Roderick Heffron, M.D. Subject: Pneumonia.

April 7—To be announced later.

May 5—Annual meeting.

The time of all meetings is 12 o'clock noon. All meetings, except February 4, will be held at the Norfolk County Hospital, South Braintree. Censors will meet on May 5 at 11:15 A. M. at the Norfolk County Hospital.

N. R. PILLSBURY, Secretary.

Suffolk District Medical Society

January 27—General Meeting in Association with the Boston Medical Library. Titles and speakers to be announced later.

February 24—Clinical Program, the Children's Hospital.

March 30—Clinical Program, New England Deaconess Hospital.

April 27—The Annual Meeting, Boston Medical Library. Election of Officers.

The Medical Profession is cordially invited to attend all of these meetings.

GEORGE S. DERBY, M.D., President.*
LELAND S. McKITTRICK, M.D., Secretary.
HILBERT F. DAY, M.D., Boston Medical Library.

Worcester District Medical Society

Wednesday evening, February 10—Worcester State Hospital. 6:30—Dinner, complimentary by the Worcester State Hospital. 7:45—A psychiatric program to be announced later.

Wednesday evening, March 9 — Memorial Hospital, Worcester, Mass. 6:30—Dinner, complimentary by Memorial Hospital. 7:45—A pediatric meeting with subjects to be announced later.

Wednesday evening, April 13—Grafton State Hospital, North Grafton, Mass. 6:30—Dinner, complimentary by Grafton State Hospital. 7:45—Program to be announced later.

Wednesday afternoon and evening, May 11—Annual Meeting. Program to be announced later.

ERWIN C. MILLER, Secretary.

*Deceased.

BOOK REVIEWS

Eye, Ear, Nose and Throat for Nurses. By JAY G. ROBERTS, PH.G., M.D., F.A.C.S., Chief of Staff, Eye, Ear, Nose and Throat, Los Angeles County Health Center. First Edition. Cloth, pp. 213, with 102 half-tone and line engravings. Philadelphia, F. A. Davis Company. Price $2.25.

This manual was written for nurses whose training was deficient in the care of eye, ear, nose and throat diseases. Its value lies chiefly in the tables of instruments necessary for the various operations.

The treatment that the author discusses is, in many instances, not that which is generally accepted.

Medical Electricity for Students. By A. R. I. BROWNE, Radiographer at the Royal Alexandra Infirmary, Paisley. Third Edition. 245 pages including index. Published by Humphrey Milford, Oxford University Press, 1931. Cloth Price $4.00.

The principal change in this edition appears to be in the addition of the syllabus of an examination in Medical Electricity, and copies of recent papers.

The student with a limited amount of time will find this a very useful manual for rapid review. It has a few illustrations. It is particularly recommended to those who do not have a copy of previous editions. It expresses in simple language the fundamentals necessary for the teacher as well as for the practitioner of electrotherapeutics.